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SOUTH AFRICAN IRIDACEAE. THE GENUS *IXIA*.

G. J. Lewis

(*Botanical Research Officer, National Botanic Gardens of South Africa, Kirstenbosch*)

ABSTRACT

The genus *Ixia* (Iridaceae), endemic to the Cape Province, is revised. The reason for proclaiming the name a nomen conservandum in 1935 is explained in an outline of the history of the genus. Forty-four species and twenty varieties are described, the majority of the varieties and eight of the species new. *Tritonia* subgenus *Dichone*, now transferred to *Ixia* as a subgenus, contains eight species, two of them new and two transferred here from the subgenus *Ixia*. In the subgenus *Ixia*, with thirty-six species, three of the four sections previously established are upheld. Keys to the subgenera, sections and species are provided, six species and one variety are figured and there is a brief note on geographical distribution. To facilitate reference to numerous changes made in connection with a number of species belonging to *Ixia* and other genera, a list of all names published under *Ixia* since 1753 is given in an appendix.

INTRODUCTION

This attractive genus of the Iridaceae, endemic to the Cape Province, was introduced into gardens in England and Europe two hundred or more years ago, and the number of illustrations of various species which appeared in botanical and horticultural works of the second half of the eighteenth and early part of the nineteenth centuries give evidence of the popularity of these plants during that period. Unfortunately, as happened in most genera of the South African Iridaceae, several of the better known species soon became involved in misidentifications and considerable confusion, much of which has persisted to this day.

The need for some clarification was expressed as early as 1794 when the editor of Curtis's Botanical Magazine, under t. 256, a figure of *Ixia longiflora* (= *I. paniculata*), wrote as follows: "We are not acquainted with a tribe of plants which stand more in need of elucidation than those of this genus; of the vast number imported from the Cape within these few years, where they are chiefly natives, few comparatively are well ascertained; some of them appear subject to great variation, both in the size and colour of their blossoms (whether in their wild state they are thus inconstant, or whether these are seminal varieties raised by the persevering industry of the Dutch florists, we have not yet had it in our power satisfactorily to ascertain)".

After studying the plants in the field for several years I can now answer the questions raised by Curtis, for I have found that there is a great deal of variation not only in the size and colouring of the flowers but also in the size of the whole plant. He was also right in suspecting that some of the plants imported from Holland were hybrids as many of the species are known to hybridize readily and there is no doubt that a large number of hybrids were produced in Europe at that time, as for example almost all of those figured by Jacquin in 1797 as varieties of *I. maculata*, on plates 21 and 22 of his Hortus Schoenbrunniensis.

At the time when Curtis wrote, the genus *Ixia* comprised members of at least nine different genera, i.e. *Ixia*, *Hesperantha*, *Geissorrhiza*, *Sparaxis*, *Tritonia*, *Dierama*, *Synnotia*, etc., but although the genus, as defined and understood to-day, is no longer the "tribe of plants" referred to by him, it is still as much in need of revision as it was in 1794. The last account to appear, that of Baker in the sixth volume of the Flora Capensis, published in 1896, remains the standard work for lack of any other, though it is out of date, inaccurate, and contains a number of misidentifications and mistakes in the nomenclature. Of the twenty-three species he placed in the genus, four have since been found to belong to other genera, while the main characters which he used for distinguishing the species, namely the size and colour of the flowers, have proved to be unreliable since both are subject to so much variation.

In undertaking a revision of the genus I have come up against several problems in the nomenclature and taxonomy, and in trying to solve some of the involved problems in the former I have to some extent been handicapped by not having access to certain botanical works not available in this country, as well as by not having seen a few of the types.

The difficulties encountered by anyone dealing with the Iridaceae, and *Ixia* in particular, were pointed out by Ker in 1802 when he wrote as follows in the Botanical Magazine, under a figure of *I. capillaris* (t. 570): "Throughout this natural order, in which the different species and genera slide imperceptibly into one another, it is often impossible to mark the exact limits of each, and the means adopted by different authors will be found perpetually inadequate to the task. Thus the relative proportion of the tube to the spathe and of the border (lobes) to the tube, though sometimes material, often afford no ground whatever for specific distinction, even differing in different years in the same plant." This variability and lack of stable demarcation between some of the species must inevitably result in a difference of opinion among botanists on the concept of some of them. A knowledge of the plants in their natural habitat has largely aided and influenced me in my treatment of some of these controversial species.

ACKNOWLEDGMENTS

In the course of my investigations a large number of living plants in the field and those in cultivation in the National Botanic Gardens of South Africa, Kirstenbosch, have been studied, as well as several hundred herbarium specimens in the following institutions:

Bolus Herbarium, University of Cape Town	BOL
Department of Botany, University of Cape Town	CT
Compton Herbarium, National Botanic Gardens, Kirstenbosch	NBG
South African Museum Herbarium, National Botanic Gardens, Kirstenbosch	SAM
National Herbarium, Pretoria	PRE
Royal Botanic Gardens, Kew	K
British Museum (Natural History)	BM
Linnaean Society, London	LINN
Naturhistoriska Riksmuseet, Stockholm	S
Botanical Gardens and Museum, Uppsala	UPS
Conservatoire et Jardin Botaniques, Geneva	G
Botanische Garten und Museum der Universität, Zürich	Z
Botanische Staatssammlung, München	M
Botanisches Museum, Berlin-Dahlem	B
National Natural History Museum, Paris	P
Jardin Botanique de l'Etat, Bruxelles	BR
Rijksherbarium, Leiden	L

The collections of the majority of these institutions were sent here on loan and I have to thank the Directors and Curators of those concerned for their kind co-operation in rendering this service. *Ixia* material in the British Museum, the Linnaean Society, the Natural History Museum, Paris, the Herb. Delessert, Geneva and Thunberg's Herbarium in Uppsala, was examined during a visit to England and Europe in 1949, and I am grateful to the Directors and Curators for the facilities provided and the assistance I received at that time.

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HISTORICAL NOTE

The following brief outline of the history of the genus *Ixia* will give some idea of the confusion in which it has been involved and the various treatments it has received from the time of its inception until 1935, when the name *Ixia* was declared a *nomen conservandum.*

The first two species of *Ixia* described in the Species Plantarum by Linnaeus in 1753 do not belong to the genus as understood to-day, one being *Aristea africana* and the other *Belamcanda chinensis.* In the second edition of the "Species Plantarum", published nine years later, Linnaeus retained the two species previously described and added eight more (one in the appendix), but though half of these are species of *Ixia* the others belong to four different genera, namely *Romulea*, *Lapeirousia*, *Sparaxis* and *Tritonia.* During the next thirty to forty years a great many more species were described by the botanists De la Roche, Burmann f., Linnaeus f., Thunberg, Jacquin and others, but comparatively few of them are Ixias, the majority belonging to the genera mentioned above as well as to *Geissorrhiza*, *Hesperantha*, *Babiana*, *Synnotia*, *Dierama* and two or three other genera. However, it was soon recognized by various authors that these could not all be classed together and towards the end of the century and in the early part of the nineteenth century, one after the other, most of the genera named above were segregated and established as separate genera with many of the species belonging to them removed from *Ixia.*

Ixia was thus gradually reduced and the generic name, instead of being widely used for a large and heterogeneous collection of species, came to be more or less generally accepted for a small and fairly well circumscribed group of plants, most of which are now recognized as belonging to the genus *Ixia.* According to the modern rules of botanical nomenclature the use of the generic name for this group is not correct as the first two species described by Linnaeus were later excluded from the genus, but to avoid further confusion it was agreed at the 1935 International Botanical Congress that the name should be conserved, and that the genus be treated as having originated in 1762 in the second edition of Linnaeus' Species Plantarum, in part, as emended by Ker in 1804 in Koenig and Sims' Annals of Botany (excluding the species), and by Baker in 1877 in the "Journal of the Linnaean Society". It was agreed also that the type species should be *I. polystachya* L.

From 1762 on, the genus received various treatments by different authors and has undergone several changes. Some of the species have, at one time or another, been placed in genera other than *Ixia*, and one species in particular, the long-tubed *I. paniculata*, has been associated with no less than eight different generic names. It was originally named *I. paniculata* by De la Roche when he described and figured it in 1766. Fourteen years later a description and figure were published by Houttuyn, named by him *Houttuynia capensis*, but this figure was misinterpreted by Ker in 1803 and as a result *Houttuynia* Houtt. was placed as a synonym of *Acidanthera* instead of *Ixia*. The error was pointed out by Merrill in 1938 (Journ. Arn. Arb. 19: 328), when he wrote as follows:

"In the 'Botanical Magazine', 17: t. 618. 1803, Ker-Gawler illustrated and described a plant as *Tritonia capensis* which he based nomenclaturally on *Houttuynia capensis* Houtt. The plant he illustrated is *Acidanthera capensis* Benth.; Baker in Thiselton-Dyer, Fl. Cap. 6: 133. 1896. As a result of Ker-Gawler's misinterpretation of Houttuyn's species, the genus *Houttuynia* Houtt. is erroneously placed as a synonym of *Acidanthera* Hochstetter, although it seems manifestly to appertain to *Ixia*. *Houttuynia* Houtt. (1780) has priority over *Houttuynia* Thunb. (1784), but as the latter name is in general use for a very different group of plants in the Saururaceae it seems desirable to conserve the saururaceous *Houttuynia* Thunb. . . ." (N.B. This was done at the International Botanical Congress in Paris in 1954).

"Not being able to solve the problem of the identity of *Houttuynia capensis* Houtt. to my satisfaction, an appeal was made to Dr. R. H. Compton at Kirstenbosch. He states that Miss Barker who investigated the matter reports that in her opinion the 'Botanical Magazine' plates 618 and 1531 (*Tritonia capensis* Ker-Gawler = *Acidanthera capensis* Benth.) do not represent the same species as that figured by Houttuyn. And that Houttuyn's illustration is a much better match for *Ixia paniculata* De la Roche, a species that occurs in the Cape Peninsula, and which has a regular flower with very short bracts. . . . Miss Barker's findings were confirmed by Miss G. J. Lewis."

In 1812 the generic name *Hyalis* Salisb. was published, in association with four species of *Ixia*, but as Salisbury supplied no generic description the name *Hyalis* is a *nomen nudum*. Baker cited *Hyalis* Salisb. as a synonym of *Morphixia* Ker in his Systema Iridacearum in 1877 (Journ. Linn. Soc. Bot. 16: 96), but he later adopted Salisbury's name for a subgenus of *Ixia*, with a very brief diagnosis (Handbk. Irid. 161 (1892) and Fl. Cap. 6: 77 (1896)).

The genus *Morphixia* was founded by Ker in 1827 (Gen. Irid. 105) to contain four species of *Ixia* with a campanulate or funnel-shaped perianth tube, thereby distinguished from *Ixia* in which the perianth tube is slender and cylindrical. Baker described three new species of *Morphixia* in 1876, and in his Systema Iridacearum, published the following year, he upheld *Morphixia* as a genus, and listed nine species, but in his Handbook of the Iridaceae and the Flora Capensis he reduced it to a subgenus of *Ixia* and transferred some of the nine species to the subgenus *Hyalis*, and one of them to the genus *Watsonia*. It has since been found that five of these nine species belong to five different genera.

Klatt, in 1882, also upheld *Morphixia* as a genus though his treatment differed somewhat from that of Baker. He gave as a synonym *Hyalis* Salisb., but transferred to *Morphixia* the species of *Ixia* with connate filaments (i.e. *I. monadelpha* and *I. curta*) and by raising to specific status some of the varieties of *I. columnaris* (= *I. monadelpha*) figured by Andrews, he brought the number of species in *Morphixia* to fifteen. Baker considered the various varieties figured by Andrews to be forms of *I. monadelpha* (with which I agree), but placed this species as the only one in a separate subgenus, *Eurydice* (due to a typographic error spelt *Euryolice* in the Flora Capensis), adopting the name used by Persoon in 1805 (Syn. 1: 48) for a section of *Ixia* distinguished by having connate filaments.

Another generic name which enters into the history of *Ixia* is *Freesea*, published by Ecklon in 1827 in his Topographisches Verzeichniss (p. 30), but as he gave no generic description it is a *nomen nudum*—it is not the same as the well-known genus *Freesia* Klatt. Ecklon associated five species with *Freesea*, four of which are at present placed in *Tritonia*, but one is *Ixia paniculata* De la R., i.e. *Freesea longiflora* Eckl. (syn. *Tritonia longiflora* Ker).

Two other names which should be mentioned are *Waitzia* Reichb. and *Wuerthia* Regel. The former. published by Reichenbach in 1828 (Consp. 60) is not legitimate as Wendland had used the name ten years earlier for a genus of Compositae, but in 1840 Heynbold made several illegitimate new combinations with *Waitzia* Reichb. (Nomen. 1: 854), among them *W. concolor*, W. *longiflora*, *W. tenuiflora* and *W. rochensis*, based on *Tritonia concolor*, *T. longiflora*, *T. tenuiflora* and *T. rochensis*. The first three are all synonyms of *Ixia paniculata* De la R. (see note under that species), and the last a synonym of *I. bellendenii* Foster, a new name given to this species in 1936.

Wuerthia Regel was published in 1851 (Bot. Zeit. 9: 595), with a single species, *W. elegans*. I have not seen the original description or type but the plant figured two years later as *W. elegans* (Gartenfl. 98: t. 46. f. 2) is an *Ixia*, probably a form of *I. polystachya* L.; in a note under that species I have mentioned the different opinions that have been held about the plant figured.

The last revision of *Ixia* to be published is that of Baker in the sixth volume of the Flora Capensis. Reference has already been made to the fact that his treatment of the genus in 1896 in the Flora Capensis is not the same as in his Systema Iridacearum published in 1877. In his last work he combined *Morphixia* with *Ixia* and described twenty-three species, divided among four sub-genera as follows: *Ixia* 14; *Eurydice* 1; *Morphixia* 5; *Hyalis* 3. As mentioned before, four of the species have since been found to belong to other genera.

In 1888 Pax, in Engler and Prantl's Pflanzenfamilien, divided the genus into three sections, *Ixia*, *Eurydice* and *Morphixia* (including *Hyalis*). Diels, in the second edition of the Pflanzenfamilien, published in 1930, also divided the genus into three sections but he combined *Eurydice* with *Ixia* and treated *Morphixia* and *Hyalis* as separate. In 1895 Durand and Schinz, in their Conspectus Florae Africae, listed forty-one species of *Ixia* but made no mention of sections or subgenera, nor did Phillips refer to them in 1951 in the second edition of his Genera of South African Plants, where he gave the number of species in *Ixia* as 25—30. In the present revision the three sections as proposed by Diels are maintained and I have also transferred *Tritonia* subgenus *Dichone* to *Ixia*.

THE SUBGENUS **DICHONE**

The earliest reference to *Dichone* that has been seen is that of Salisbury in the first volume of the Transactions of the Horticultural Society (p. 320), published in 1812, which reads as follows: "*Dichone crispa*. Laws. Cat. p. 6. *Ixia crispa*. Ker. in Bot. Mag. n. 599 cum Ic. *Ixia crispa* Thunb. Diss. n. 8. t. 2. f. 3."

Up to the present all efforts to trace Lawson's Catalogue have failed and it seems very unlikely that it is extant to-day. There is no copy in the libraries of Kew, the British Museum or the Linnaean Society in London, and an appeal for information made on my behalf to the firm of Peter Lawson & Son in Edinburgh reveals that the firm has nothing prior to 1851, nor could they find anything relative to Peter Lawson before 1847 in the Royal Botanic Gardens, Edinburgh, the Edinburgh Public Libraries or the National Library of Scotland.

As no generic characters were supplied by Salisbury, and it is extremely unlikely that any were given in Lawson's Catalogue, *Dichone* Laws. ex Salisb. must be regarded as a *nomen nudum*. Baker, in his Systema Iridacearum, published in 1877, cited *Dichone* "Laws." Salisb. as a synonym of *Tritonia* and adopted the name, giving a brief diagnosis, for a section of that genus (Journ. Linn. Soc. 16: 162). In his Handbook of the Iridaceae and the Flora Capensis, published in 1892 and 1896 respectively, he raised the status of this section and established *Dichone* as a subgenus of *Tritonia.* Since it has not been possible to verify Salisbury's reference to Lawson's Catalogue I have omitted Lawson's name from the citation and ascribed the subgenus to Salisb. ex Baker on transferring it from *Tritonia* to *Ixia.* Both Stapf and Sealy ascribed the genus *Dichone* to Salisbury, the former in a note under t. 9038 in the Botanical Magazine (1924) and the latter under t. 9592 (1939—40).

Baker placed two species in *Tritonia* section *Dichone* in his Systema Iridacearum and three species and one variety in *Tritonia* subgenus *Dichone* in the Flora Capensis. This small group of species has been subjected to a few other changes and they have been variously regarded as constituting a distinct genus or a section of some other genus by different botanists. Most of them were assigned to the genus *Ixia* when they were first described.

In 1827 Ecklon, in his Topographisches Verzeichniss, placed them in a separate genus, *Agretta*, but as he gave no diagnostic characters this is a *nomen nudum.* Klatt described a new genus, *Tritonixia*, in 1882 (Abh. Naturf. Ges. Halle 12: 355 and Ergänz. 23), and transferred to it several species of *Tritonia*, including the type species of that genus! He divided *Tritonixia* into two sections, *Eutritonixia* and *Dichone*, placing in the latter the three species placed in *Tritonia* subgenus *Dichone* by Baker. In 1895 Durand and Schinz upheld the genus *Tritonixia* in part only (Consp. Fl. Afr. 5: 209), to contain the three species assigned to the section *Dichone* by Klatt and one which he had placed in *Eutritonixia.* This extraordinary treatment by Klatt, Durand and Schinz is open to much criticism.

Bentham and Hooker, in 1883, made a brief reference to *Dichone* under *Tritonia* in their Genera Plantarum (3: 708), and remarked that the two species of Baker's section *Dichone* had characters more like those of *Ixia* except that the stamens and style were more or less lateral. Pax, in the first edition of Engler and Prantl's Pflanzenfamilien (1888) and Diels in the second edition (1930) followed the treatment prescribed by Baker in 1877 in his Systema Iridacearum.

It is generally agreed that the genus *Tritonia*, as arranged in the Flora Capensis, is most unsatisfactory and requires revision. A broad outline for a revision was proposed by Stapf in 1924 under t. 9038 in the Botanical Magazine, and supported by Sealy in 1939—40 under t. 9592 of the same work. Among other changes Stapf suggested that Salisbury's genus *Dichone* should be restored. There is no doubt at all that this group of species should be removed from *Tritonia* but whether *Dichone* should be treated as a distinct genus is not so certain and after examining a large number of plants, both living and dried, I found that there is so close an affinity with *Ixia* that I do not consider that it can be regarded as a separate genus and have accordingly transferred the subgenus *Dichone* from *Tritonia* to *Ixia.*

Of the eight species now recognized as belonging to this subgenus, two are new and two, *I. micrandra* Baker and *I. trifolia* Lewis, are now transferred here from subgenus *Ixia.* The vegetative parts of these eight species are the same as those of various species of *Ixia* and the short membranous bracts and bracteoles are characteristic of the genus. With the exception of *I. scillaris*, the flowers are regular and on the whole they are more uniform in size and colouring than in section *Ixia* of the subgenus *Ixia*, which they most closely resemble.

Some of the species have very distinctive anthers in which the cells do not open right to the apex but shed their pollen through narrow slits, but in others they open widely from base to apex as in *Ixia*, and in varieties of *I. micrandra* both types occur. The only stable character which separates this group of species from *Ixia* is found in the style branches, those of *Ixia* being folded together lengthwise and flat with the stigmatic surface on the margins, in some species only near the top, whereas in the subgenus *Dichone* they are more or less filiform or cylindrical with inrolled margins and the stigmatic surface at the tip.

I. scillaris differs from the other species in the subgenus in having a somewhat stouter stem and slightly irregular flowers with reclinate pendulous anthers not symmetrically arranged round the style, but in all other respects its characters are the same as those of other species in the group. In previous papers on the Iridaceae I have pointed out that the symmetry of the flower is not an infallible diagnostic character and must be considered in conjunction with the vegetative and floral characters of the plant.

DIAGNOSTIC CHARACTERS

Corm

Throughout the genus the corm is small, usually 1—2 cm. in diameter though sometimes slightly more or less, ovoid to subglobose in shape, and situated shortly below the ground surface. The pale to dark brown tunics vary in texture from very fine, sometimes almost membranous, to coarse, occasionally somewhat lignified, and in nearly all species they are either reticulate or the strands are vertical and parallel in the lower half, becoming confluent and more or less reticulate above; in a few of them they extend up to the ground surface in a neck. Clusters of cormlets are found round the corm in a few species and in a few others the corm gives rise to slender stolons which terminate in a single cormlet or cluster of very small cormlets. Very little use has been made of these characters in determining the species as they are seldom confined to a single species.

STEM

The majority of species are characterized by a slender flexible erect stem and only in a few is it somewhat stouter. It varies in height from about a foot to four feet, the average being one and a half to two and a half feet, and may be simple or branched. In some species it is always simple and in others predominantly branched, often with characteristic branches which may be short or long, straight and erect or patent and flexuose. The very short 1-flowered branchlets often found in two or three species in the section *Morphixia*, such as *I. capillaris*, *I. marginifolia* and *I. pauciflora*, give the inflorescence a racemose appearance. The absence or presence of branches and their structure afford some characters for differentiating species but they are not entirely reliable since the growth of the plant is largely affected by various factors such as differences in soil, aspect, shade, moisture and altitude, and these naturally may also affect the branching.

The inflorescence varies from a single terminal flower to a dense many-flowered spike, with the floral arrangement distichous or spiral. In several species the rachis is conspicuously flexuose and in some of them the spike is more or less declinate.

LEAVES

The leaves are few in all species, generally comprising two short basal sheathing leaves which are often more or less withered before the plants have reached the flowering stage, and two to six short to long fully developed green leaves, usually one to four basal and one or two cauline, the latter consisting mainly of a long erect amplexicaul sheathing part. In all species the leaves are glabrous and in the majority they are linear or linear-lanceolate, but they vary from linear-filiform in some to ensiform in a few others, and in texture they vary from soft and grass-like with veins just visible to firm and somewhat leathery with thickened margins and prominent, conspicuous veins. As a rule they are erect or suberect but in a few species, especially those growing in more arid parts such as Namaqualand, Calvinia and Laingsburg, one or two of the lower leaves are curved and arcuate or falcate. *I. vanzyliae* has leaves with undulate margins and in *I. crispa* they are very much more crisped or undulate. As there is a comparative stability in the form and texture of the leaves in most species, a few of the characters mentioned have been used for diagnosis.

BRACT AND BRACTEOLES

Short membranous bracts and bracteoles are characteristic of the genus but there are a few variations in shape, colour and texture which provide some characters for distinguishing the species. The bracts vary in shape from oblong-lanceolate and acute to oblong-ovate or obovate and more or less obtuse. They are usually somewhat tridentate or tricuspidate, often with the middle tooth longer and apiculate, but in the same species, sometimes even on the same plant, the apex may be acute, tridentate or subobtuse. One species, *I. stolonifera*, is distinguished by the three long setaceous cusps of the bract.

In most species the bracts are pellucid or semi-pellucid and colourless or more or less suffused with pale pink or mauve but there are a few in which they are opaque, e.g. *I. conferta* and *I. monadelpha*, and in a few others the upper portion is brown-membranous, rust-coloured or densely streaked with fine reddish brown lines, as in *I. maculata* and *I. framesii*, or occasionally they are completely brown as in *I. brunneobractea*. The brown-membranous bracts are usually rather soft and in the three species mentioned they tend to become torn at the apex as the flowers develop, whereas in almost all other species they are moderately firm and retain their form unchanged into the fruiting stage.

The bracteoles of all species are about the same length as the bract and similar in colour and texture, but they are conspicuously two-veined, usually bicarinate, and bifid, bidentate or bicuspidate. The bracts of a number of species have a few dark veins, usually three though there are sometimes five or more, or occasionally there is only one.

FLOWERS

Few genera have such a wide range of colours as *Ixia* in which there is almost every shade from white to purple-black, while the green flowers of *I. viridiflora*, with a purple-black or maroon circular stain in the middle, are unique. In his treatment of the genus in the Flora Capensis, Baker laid much stress on the colour of the flowers for distinguishing the species within the subgenera but, with a few exceptions, it is apt to be extremely variable and is therefore by no means a reliable diagnostic character. In some cases where it has been used in the past it has resulted in confusion and a few superfluous names being given to some of the species. *I. polystachya*, for example, was described as having white flowers, and though this species is now known to have colours ranging from pure white, or white with a pale blue, green or mauve circular stain in the middle, to pale or deep mauve or pink, with a darker stain, in the past only the white form was recognized as *I. polystachya* (or *I. erecta*) and most authors placed the other colour forms as varieties of *I. maculata*.

The various colour forms of *I. monadelpha* have at times been named and treated as varieties or species, and the white and crimson-flowered forms of *I. campanulata* have also been treated as separate species.

A number of species in the section *Ixia* have a conspicuous dark or contrasting circular stain of colour in the middle of the flower and in the past it was thought that this character was confined to this group but it is now known to occur in the section *Morphixia* as well, e.g. *I. framesii* and *I. leipoldtii*.

(i) *Perianth tube and lobes*

Throughout the genus the tube is straight, rarely becoming slightly curved with age, but it varies in length from 2 or 3 mm. to 7 cm., and in shape from campanulate to slender and cylindrical, sometimes more or less filiform. The character of the tube has been largely used not only for differentiating species but also as a basis for segregating the sections in the subgenus *Ixia*.

The section *Morphixia* is distinguished by its comparatively short tube which is either campanulate or dilated into a narrow or broad funnel below the lobes, with the stamens arising within the tube, near the base to shortly below the top, and the filaments decurrent on the tube. An exception is *I. fucata* which differs in having a fairly broad cylindrical tube not dilated to the throat, but as the general appearance and other characters of the plant are like those of certain species in this group it has been placed here. In the section *Hyalis* the tube is more elongated, usually distinctly longer than the lobes, and subcylindrical, very slightly and gradually expanded from base to throat or only near the top. As in *Morphixia*, the stamens arise within the tube, shortly or well below the top. Section *Ixia* differs from the other two in having a short cylindrical tube, rarely very slightly dilated below the throat, and the stamens arising at the top of the tube. There is a certain degree of variability in the shape and length of the tube in the three sections, but when these are considered in conjunction with the position of the stamens it has been found that with one or two exceptions the species can be readily placed in one or other of the groups.

The lobes are equal or subequal and oblong, obovate or occasionally suborbicular, but though the length of the lobes relative to the length of the tube has been used as a diagnostic character, little use has been made of the length and shape of the lobes as these are often very variable within the species.

(ii) *Stamens*

The stamens afford some characters of considerable diagnostic value, especially in the shape, size and method of dehiscence of the anthers, and as mentioned in connection with the perianth tube, the position of attachment of the filaments to the tube. The relative length of the anthers to the filaments is stable in most species and has been used for distinguishing some of them, and in the sections *Morphixia* and *Hyalis* the length and position of the stamens in relation to the perianth tube is used.

Baker considered the connate filaments of *I. monadelpha* to be of taxonomic importance and used this as a basis for establishing *I. monadelpha* in a subgenus by itself, *Eurydice*, but in my treatment of the genus I have followed Diels in sinking *Eurydice* in the section *Ixia* as I do not consider this character by itself to be of much significance. In several species in the section *Ixia* the filaments are more or less connivent at the base and, although not previously recorded, they are nearly always partly connate in *I. maculata*, usually only at the base but sometimes to the middle, and in *I. maculata* var. *intermedia* very often to the top. In *I. dubia* they are almost always free but in a few specimens they have been found to be slightly connate.

In the three sections of the subgenus *Ixia* the anther cells open widely from base to apex but in some species in the subgenus *Dichone* the cells do not open quite to the apex and the pollen is shed through a narrow slit. Anthers with both types of dehiscence occur in varieties of *I. micrandra* and in this species, as well as *I. crispa* and one or two others in the subgenus *Dichone*, the filaments are very short and anthers small, somewhat orbicular in shape and subdidymous. *I. scillaris* in this subgenus differs from all other species in having its stamens asymmetrically disposed, with the filaments of two slightly twisted towards the third and reclinate pendulous anthers.

(iii) *Gynaecium*

The ovary in all species is small, more or less oblong or rotund and many-seeded, and offers little of diagnostic value, nor is there much difference in the mature capsules and seeds. The style almost always reaches to the top of the perianth tube or above it and the relative position of the style branches with regard to the stamens is of some importance, though this character should be used with caution as in two or three species it is variable, e.g. *I. polystachya* and *I. paniculata*, and in others where it is normally stable a few exceptions have been found.

The character of the style branches has proved to be of very great importance and affords a means of distinguishing the species of the subgenus *Dichone* from those of *Ixia* which otherwise, in the case of one or two of them, has presented some difficulty. In all species in both subgenera the style branches are relatively short, narrow and generally more or less recurved, but in the subgenus *Ixia* they are conduplicate and stigmatic on the margins, sometimes only near the apex, and in subgenus *Dichone* they are involute-filiform or involute-cylindrical and stigmatic only at the tip.

DESCRIPTION OF THE GENUS

IXIA

L. Sp. Pl. ed. 2. 51. 1762 partim, emend. Ker-Gawl. in Koen. & Sims Ann. Bot. 1: 226. 1804 excl. sp.; Baker, Journ. Linn. Soc. Bot. 16: 90. 1877, nom. cons. (non L. Sp. Pl. 36. 1753) auct. Internat. Rules Bot. Nomencl. Append. III. n. 1302. 1935 et 1956. Benth. & Hook. Gen. Pl. 3: 704. 1883; Pax in Engl. & Prantl Pflanzenfam. II, 5: 154. 1888; Baker, Handbk. Irid. 160. 1892 et Fl. Cap. 6: 76. 1896; Marloth, Fl. S. Afr. 4: 145. 1915; Phill. Gen. S. Afr. Fl. Pl. 173. 1926 et ed. 2. 217. 1951; Levyns, Guide to Fl. Cap. Pen. 80. 1929; Diels in Engl. & Prantl Pflanzenfam. ed. 2. 15 a: 486. 1930; Lewis in Adamson & Salter Fl. Cap. Pen. 248. 1950.

HYALIS Salisb. Trans. Hort. Soc. 1: 317. 1812, nom. nud.

DICHONE Laws. ex Salisb. l. c. 320, nom. nud.

MORPHIXIA Ker, Gen. Irid. 105. 1827; Baker, Journ. Linn. Soc. Bot. 16: 96, pro parte, excl. syn. *Hyalis*; Klatt, Abh. Naturf. Ges. Halle 12: 382 et Erganz. 49. 1882, pro parte.

FREESEA Eckl. Top. Verz. 30. 1827, nom. nud.

AGRETTA Eckl. l. c. 23, nom. nud.

WUERTHIA Regel, Bot. Zeit. 9: 595. 1851.

HOUTTUYNIA Houtt. Nat. Hist. 12: 448. 1780, nom. rejic.; non Thunb. 1784, nom. cons. auct. Internat. Code. Bot. Nomencl. Append. III. n. 1857. 1956.

The name is taken from an old Greek name for a plant noted for the variability of its colouring. The common name for several species is Klossie or Kalossie, probably derived from klokkie (little bell).

Corm small, ovoid to globose, with tunics of fine to moderately coarse fibres, usually more or less reticulate, sometimes extending up in a short neck. *Stem* nearly always slender and wiry, simple or branched. *Leaves* few, distichous, filiform to ensiform, soft and grass-like to firm with prominent veins. *Spike* few to many-flowered, lax or fairly dense, sometimes capitate, distichous or spirally arranged. *Bract* short, membranous or chartaceous, oblong-lanceolate, ovate or obovate, usually tridentate or shortly cuspidate or tricuspidate, sometimes with a few dark veins; *bracteoles* about as long as the bract, bicuspidate or bifid, 2-veined and usually bicarinate. *Flowers* small to fairly large, almost always actinomorphic with the stamens symmetrically disposed, in one or two species zygomorphic with the perianth lobes equal but sometimes slightly irregularly placed and reclinate pendulous anthers asymmetrically arranged; *perianth tube* short or long, cylindrical and slender or more or less dilated upwards and infundibuliform or campanulate; *lobes* equal or subequal, patent, usually subrotate, oblong, obovate or occasionally suborbicular. *Stamens* arising at top of perianth tube or below, included in the tube or well exserted; filaments filiform, rarely flat, shorter or longer than the anthers, sometimes more or less connate; anthers basifixed or attached shortly above the base, linear to suborbicular, sagittate or rounded at the base, the cells usually opening widely from base to apex but in some species by a narrow slit not extending to the apex. *Ovary* small, oblong or rotund, many-seeded; style filiform, reaching to top of perianth tube or well exserted, with three short spreading branches. *Capsule* small, oblong to globose, thin-walled, sometimes membranous, loculicidally 3-valved; seeds small, brown, more or less angled by pressure.

Type species: *I. polystachya L.*

KEY TO THE SUBGENERA

1. Flowers regular with a short or long perianth tube varying from filiform to campanulate and stamens symmetrically disposed; anthers linear, linear-oblong or lanceolate with narrow cells opening widely from base to apex; style branches conduplicate and stigmatic on the margins, sometimes only near the apex . . *Ixia*
(Exception: stamens occasionally directed to one side and unilateral in a form of *I. fucata*)

1. Flowers always with a short slender cylindrical perianth tube, regular with the stamens symmetrically disposed or in one or two species zygomorphic with reclinate pendulous anthers asymmetrically arranged; anthers small, suborbicular to oblong, usually subdidymous with a narrow connective and fairly wide cells sometimes opening from base to apex but more often by a narrow slit not extending to the apex; style branches involute-filiform or involute-cylindrical, stigmatic at the apex only *Dichone*

KEY TO SECTIONS OF SUBGENUS *IXIA*

1. Perianth tube slightly to distinctly expanded towards the throat, rarely broadly cylindrical or tubular to the top; stamens arising shortly or well below top of perianth tube, the filaments always free.

  2. Perianth tube up to 2 cm. long, dilated into a narrow or broad funnel below the lobes (rarely tubular to the throat and not dilated), shorter than the lobes or occasionally as long or slightly longer; stamens arising shortly or well below top of perianth tube with the filaments decurrent on the tube and included or well exserted . . . . 1. *Morphixia*

  2. Perianth tube 2 cm. or more long (rarely less), subcylindrical, slightly and gradually expanded from base to throat or in the upper third, usually distinctly longer than the lobes; stamens arising shortly or well below top of perianth tube and included or exserted . . . . 3. *Hyalis*
  (Exception: in southern form of *I. longituba* the perianth tube is shorter, 1·2—1·8 cm. long, sometimes slightly shorter than the lobes)

1. Perianth tube short, up to 1·8 cm. long but usually less, cylindrical, slender, rarely slightly expanded to the throat, shorter than the lobes; stamens arising at top of perianth tube and well exserted, the filaments not decurrent on the tube, often connivent at the base and sometimes partly or entirely connate .. .. 2. *Ixia*

(Exceptions: perianth lobes sometimes as long as tube in *I. monadelpha*; perianth tube subinfundibuliform in *I. purpureorosea* and sometimes in *I. flexuosa* but filaments arising at top of tube and not decurrent)

KEY TO THE SECTION *MORPHIXIA*

1. Perianth tube tubular throughout or at least in the upper half, not dilated to the throat; stamens exserted .. .. 12. *fucata*

1. Perianth tube dilated to the throat and narrowly to broadly funnel-shaped or campanulate, rarely somewhat tubular but if so then the stamens not or very little exserted.

2. Stamens with filaments shortly to well exserted from perianth tube.

3. Perianth tube short, about half as long as the lobes, not or very little exserted from the bract.

4. Bracts shining chestnut-brown all over, sometimes torn at the apex when flowers open .. .. .. 4. *brunneobractea*

4. Bracts not as above.

5. Leaves linear or linear-filiform, up to 2 mm. wide .. 2. *capillaris*

5. Leaves lanceolate or ensiform, 0·5—1·8 cm. wide, the lowest often falcate.

6. Plant 10—20 cm. high, with 1 or occasionally 2 branchlets .. .. 5. *latifolia* var.

6. Plant usually more than 25 cm. high, with 4 to several branchlets .. .. 1. *marginifolia*

3. Perianth tube about as long as the lobes or slightly longer or shorter (sometimes about a third shorter), well exserted from the bract.

7. Bracts with the upper half dull brown or rust-coloured, inconspicuously nerved, often torn at the apex .. .. 9. *framesii*

7. Bracts not as above.

8. Leaves linear-filiform, not more than 1 mm. wide; bracts about 1 cm. long and flowers fairly large, 1 or 2, sometimes 3, to a plant .. .. 7. *pauciflora*

8. Leaves linear to ensiform, seldom less than 2 mm. wide but if so then the bracts not more than 5 mm. long and flowers 4 or more to a spike.

9. Filaments distinctly longer than anthers.

10. Leaves 3, 0·8—2 cm. wide .. .. .. 5. *latifolia*

10. Leaves 3—6, 1—4 mm. or occasionally to 5 mm. wide.

11. Corm tunics usually extending up in a short neck; bracts 4—5 mm. long; perianth tube slender, not more than 3 mm. diam. at the throat .. .. 8. *cochlearis*

11. Corm tunics not extending up in a neck; bracts 5—8 mm. long; perianth tube 4—7 mm. diam. at the throat .. .. 5. *latifolia* var.

9. Filaments and anthers about the same length or anthers slightly longer than filaments.

12. Flowers yellow (occasionally white but if so then very small, up to 1·5 cm. long), fragrant; style usually reaching to top of perianth tube with comparatively long slender branches usually about half its length .. .. 10. *odorata*

12. Flowers not yellow; style reaching to middle of filaments or above, with short branches less than half its length.

13. Perianth tube 4—7 mm. diam. at the throat 5. *latifolia* var.

13. Perianth tube narrowly funnel-shaped, 2—3 mm. diam. at the throat.

14. Perianth tube slightly longer than the lobes .. .. 11. *stohriae*

14. Perianth tube shorter than the lobes .. 13. *orientalis*

2. Stamens included in perianth tube or the filaments included and anthers partly to entirely exserted, rarely the tips of the filaments very shortly exserted.

15. Perianth tube not or only shortly exserted from bract, 5—8 mm. long, about half as long as the lobes.

16. Leaves linear or linear-filiform, not more than 2 mm. wide .. .. 2. *capillaris*

16. Leaves lanceolate or ensiform, 0·5—1·4 cm. wide .. 3. *rapunculoides*

15. Perianth tube well exserted from bract, 0·8—2 cm. long, usually as long as lobes or slightly shorter or longer, rarely only half as long.

17. Bracts dark brown or rust-coloured above the base, inconspicuously nerved, soft and usually torn at the apex; flowers deep salmon-pink, reddish, red and yellow or yellow, with a small dark stain in the middle 9. *framesii*

17. Bracts not as above, if brownish then conspicuously 3 or 5-veined and not soft and torn at the apex.

18. Perianth lobes white with the lower third wine-coloured, orbicular or suborbicular with a short broad claw .. .. 6. *leipoldtii*

18. Perianth lobes unicoloured, usually more or less oblong, if suborbicular then not or scarcely clawed at the base.

19. Perianth tube narrow, slightly and gradually dilated upwards but not more than 3 mm. diam. at the throat, sometimes the upper half somewhat tubular .. .. 11. *stohriae*

19. Perianth tube widely dilated and 0·5—1 cm. diam. at the throat, funnel-shaped or campanulate.

20. Leaves linear or linear-filiform, not more than 1 mm. wide; flowers few, usually 1—3 to a plant, fairly large with the perianth tube about 1·5 cm. long.. .. 7. *pauciflora*

20. Leaves linear to ensiform, more than 1 mm. wide; flowers usually several or many to a plant .. .. 3. *rapunculoides* var.

KEY TO THE SECTION *IXIA*

1. Filaments free.

2. Leaves with undulate margins.. .. .. 27. *vanzijliae*

2. Leaf margins not undulate.

3. Flowers green with a dark purple or reddish centre; anthers very long and narrow, about three times as long as filaments .. .. 17. *viridiflora*

3. Flowers not green; anthers from as long as filaments to twice or slightly more than twice as long, rarely 3 times as long.

4. Bracts with the upper half or more rust-coloured or densely streaked or spotted with reddish-brown and more or less papyraceous.

5. Flowers cream-coloured, pale yellow or red with a dark centre; style reaching to base of filaments (rarely above) with the branches projecting between them at the base . . . . 19. *conferta*

5. Flowers orange or yellow; style reaching to base or middle of anthers, the filaments connivent at the base . . . . 29. *maculata*

4. Bracts sometimes inconspicuously spotted with brown at the apex, rarely slightly rust-coloured but if so then not papyraceous.

6. Bracts with 3 long setaceous cusps . . . . . . 16. *stolonifera*

6. Bracts usually tridentate or tricuspidate but the cusps not with long setaceous tips.

7. Perianth tube very short compared with lobes, 2—4 mm. or occasionally to 6 mm. long, the lobes usually 4—8 times longer.

8. Leaves long, linear, firm and erect, the lower 1 or 2 overtopping the spike . . . . 25. *vinacea*

8. Leaves occasionally reaching to base of spike but usually much shorter.

9. Stem straight; bracts 6—10 mm. long, slightly to distinctly longer than wide.

10. Flowers with a conspicuous purple-black stain in the middle . . . . 26. *gloriosa*

10. Flowers concolorous or with a small insignificant white or greenish circle in the middle . . . . 18. *patens*

9. Stem straight or flexuose; bracts short, 4—6 mm. long, usually slightly wider than long.

11. Stem almost always simple, 10—35 cm. long; flowers crimson with or without a longitudinal white band, pure white or white flushed with red outside . . . . . . 23. *campanulata*

11. Stem usually 35—75 cm. long, simple or more or less divaricately branched; flowers pale pink or mauve with a purplish red star near the base of each lobe . . . . . . 24. *metelerkampiae*

7. Perianth tube $0 \cdot 4$—$1 \cdot 5$ cm. long, occasionally as long as the lobes but usually about a third to half as long.

12. Anthers and filaments equal in length or the anthers up to 1 mm. longer.

13. Leaves firm and more or less costate with several fairly prominent veins and narrow cartilaginous stramineous margins; stem usually fairly short and moderately stout . . 18. *patens*

13. Leaves rarely as above, the veins usually few and scarcely prominent and margins not or only slightly raised; stem usually long and slender.

14. Bracts often pinkish with a few fine dark veins; flowers mauve, pink or white, the white usually with radiating purplish lines; perianth tube 4—6 mm. long, less than half as long as the lobes which are usually somewhat campanulate at the base when not fully expanded . . . . 15. *flexuosa*

14. Bracts usually white or whitish with pale insignificant veins; flowers cream or pale yellow, rarely pale mauve-pink; perianth tube usually $0 \cdot 6$—$1 \cdot 2$ cm. long and about half as long as the lobes which are seldom slightly campanulate at the base . . 14. *polystachya*

12. Anthers distinctly longer than filaments, up to twice as long or sometimes more.

15. Spike lax or moderately lax, the bracts not or very slightly imbricate.

16. Leaves 3—4; bracts 8—10 mm. long; perianth lobes distinctly campanulate at the base; anthers connivent at the apex .. .. 26. *gloriosa*

16. Leaves more than 4; bracts usually less than 8 mm. long; lobes not or hardly campanulate at the base; anthers more or less diverging .. .. 14. *polystachya*

15. Spike fairly to very closely flowered, often more or less capitate, the bracts distinctly imbricate.

17. Corm with a fibrous neck; leaves linear, the lower 1 or 2 overtopping the spike .. 25. *vinacea*

17. Corm without a neck; leaves not or seldom reaching to base of spike.

18. Stem with 1 or more branches spreading stiffly at an angle of 45—90 degrees, terminating in a short few-flowered erect spike; flower with a large dark or contrasting stain covering a third to half its area .. 21. *rouxii*

18. Branches when present usually erect or suberect but if as above then the flower with a smallish dark or contrasting stain covering a quarter of its area or less.

19. Stem simple; bracts whitish and soft; flower mauve-pink with a purple-black stain in the middle; perianth tube subinfundibuliform 22. *purpureorosea*

19. Stem simple or branched; bracts usually moderately firm; perianth tube cylindrical.

20. Flowers bright yellow or orange with or without a dark stain in the middle, the outer lobes sometimes red outside.

21. Bracts usually widest near the apex, the lower half more or less opaque and often yellowish; perianth lobes obovate or suborbicular and somewhat unguiculate, often with distinct interstices at the base 19. *conferta* var.

21. Bracts seldom widest near the apex, more or less pellucid, not yellowish below: perianth lobes usually widest at or near the middle and more or less overlapping at the base.

22. Bracts nearly always faintly striate; flowers usually with a dark stain; style reaching to middle or top of filaments, rarely only to

the base but if so then the leaves firm with prominent cartilaginous margins .. .. 28. *dubia*

22. Bracts not or seldom faintly striate; flowers rarely with a small dark stain; style seldom reaching above base of filaments but if so then the leaves fairly soft without prominent margins .. .. .. 14. *polystachya* var. *lutea*

20. Flowers not bright yellow or orange.

23. Perianth lobes obovate or suborbicular and somewhat unguiculate, often with distinct rounded or subacute interstices at the base .. 19. *conferta* var. *ochroleuca*

23. Perianth lobes not as above, usually widest at or near the middle and more or less overlapping at the base.

24. Leaf margins prominent, cartilaginous, involute and more or less crenulate; stamens erect, the anthers connivent at the apex .. 20. *versicolor*

24. Leaf margins sometimes more or less prominent and cartilaginous but not crenulate; stamens usually diverging .. 14. *polystachya* vars.

1. Filaments partly to entirely connate.

25. Filaments connate at the base only, rarely nearly to the middle.

26. Bracts 0·8—1·5 cm. long, the upper half or more ferruginous and papyraceous, usually more or less lacerated at the apex .. .. 29. *maculata*

26. Bracts 5—9 mm. long, not as above.

27. Bracts pellucid, colourless or pinkish, usually more or less striate with several slightly prominent pale veins; anthers diverging .. .. 28. *dubia*

27. Bracts more or less opaque, whitish nearly always with minute dark or reddish brown flecks at the apex and often with a dark cusp or mucro; anthers erect 31. *monadelpha*

25. Filaments connate to the middle or the top.

28. Flowers orange or yellow with obovate, oblong or somewhat ovate more or less concave lobes 1—2 cm. wide and usually from 1½—3 times as long as the tube.

29. Bracts usually obtuse or truncate (occasionally acute or shortly tridentate), whitish or more often distinctly bicoloured with the lower half whitish and upper ferruginous and papyraceous; perianth tube 6—8 mm. long (rarely to 1 cm.), not or only shortly exserted from the bract; filaments usually connate to the middle .. .. 29. *maculata* var.

29. Bracts with a short to fairly long cusp or mucro, carinate, pallid with brown or reddish brown flecks; perianth tube 1—1·5 cm. long, well exserted from the bract; filaments usually completely connate .. 30. *curta*

28. Flowers variously coloured but not or rarely orange or yellow, the lobes usually patent, oblong and up to 1 cm. wide, generally about as long as the tube or slightly shorter or longer, occasionally obovate or obovate-oblong and up to $1\frac{1}{2}$ times as long as the tube but if so then the flowers not orange or yellow .. .. .. 31. *monadelpha*

KEY TO THE SECTION *HYALIS*

1. Filaments included in the perianth tube and anthers either included or partly exserted.

2. Stem usually branched; perianth tube 4—7 cm. long (rarely 3·5 cm.) .. .. 32. *paniculata*

2. Stem usually simple; perianth tube not more than 3 cm. long.

3. Leaves 4—5; anthers included in perianth tube .. .. 33. *splendida*

3. Leaves 2—3; anthers exserted from perianth tube .. .. 34. *paucifolia*

1. Filaments shortly to well exserted from perianth tube.

4. Leaves 2—3; perianth lobes 0·7—1·2 cm. long, less than half as long as the tube; filaments 2—4 mm. long, shortly exserted from the tube .. .. 34. *paucifolia*

4. Leaves 4—6; perianth lobes 1·2—2 cm. long, usually more than half as long as the tube, sometimes as long or even slightly longer.

5. Flowers large, the lobes usually 2 cm. long, filaments 7—8 mm. and anthers 5—7 mm. long; style reaching to middle or top of anthers .. .. 35. *bellendenii*

5. Flowers somewhat smaller than above, the lobes usually less than 2 cm. long, filaments and anthers slightly shorter and style not reaching above middle of anthers, usually below .. .. 36. *longituba*

KEY TO THE SUBGENUS *DICHONE*

1. Flowers regular with the stamens symmetrically disposed.

2. Leaf margins much crisped or undulate .. .. .. 38. *crispa*

2. Leaf margins flat.

3. Perianth tube very short, not more than 1·5 mm. long; flowers pale blue or violet-blue .. .. 41. *brevituba*

3. Perianth tube 3—6 mm. long; flowers mostly pale to deep pink, occasionally mauve or white.

4. Leaves very narrow, rarely more than 1 mm. wide and usually terete, subterete or filiform .. .. .. 37. *micrandra*

4. Leaves linear or lanceolate.

5. Anthers 1·5—3 mm. long, suborbicular or broadly oblong.

6. Leaves 3—4, lanceolate, erect and firm to somewhat rigid with stramineous margins and mid-rib, usually brown and spirally twisted towards the apex at flowering time .. .. 39. *stricta*

6. Leaves not as above.

7. Leaves 2, the lower short, lanceolate and firm with 3 prominent stramineous veins .. .. 40. *trinervata*

7. Leaves 2—4, usually fairly long, linear or lanceolate, soft to moderately firm, the veins sometimes prominent but not stramineous .. .. 37. *micrandra* var.

5. Anthers 3—5 mm. long, oblong, more than twice as long as wide.

8. Corm usually with a fibrous neck; leaves linear, 2—4 mm. wide, all arcuate; bract 4—5 mm. long **43.** *curvata*
8. Corm without a fibrous neck; leaves lanceolate, usually 0·6—1 cm. wide, the lowest falcate and others usually erect and more or less straight but sometimes arcuate; bract 7—9 mm. long .. .. **42.** *trifolia*
1. Flowers slightly zygomorphic with reclinate pendulous anthers not symmetrically disposed.
9. Leaf margins undulate .. .. **44.** *scillaris* var.
9. Leaf margins flat.
10. Leaves linear, all arcuate .. .. **43.** *curvata*
10. Leaves lanceolate or ensiform, occasionally all arcuate but more often the lowest falcate or arcuate and others suberect to erect and straight or almost so .. .. **44.** *scillaris*

SUBGENUS **IXIA**

Flowers actinomorphic; *perianth tube* short or long, cylindrical or slightly to well expanded upwards and infundibuliform or campanulate; *lobes* equal or subequal; *stamens* arising at throat of perianth tube or below, symmetrically disposed, the filaments short or long, occasionally partly to entirely connate: *anthers* linear, linear-oblong or lanceolate, often more or less sagittate, with narrow cells opening widely from base to apex; *style* reaching to top of perianth tube or well exserted, the branches recurved or falcate, linear, oblanceolate or spathulate, conduplicate, minutely papillate or clavellate fimbriate on the margins, sometimes only towards the apex.

Type species: *I. polystachya* L.

Section **MORPHIXIA**

(Ker) Diels in Engl. & Prantl Pflanzenfam. ed. 2. 15 a: 486. 1930. *Morphixia* Ker, Gen. Irid. 105. 1827, pro. gen.; Baker, Journ. Linn. Soc. Bot. 16: 96. 1877; Klatt, Abh. Naturf. Ges. Halle 12: 382 et Erganz. 49. 1882, pro parte. *Ixia* subgen. *Morphixia* (Ker) Baker, Handbk. Irid. 161. 1892 et Fl. Cap. 6. 77: 1896.

Perianth tube up to 2 cm. long, cylindrical at the base and dilated into a narrow or broad funnel below the lobes (in one or two species tubular to the throat and not dilated), usually shorter than the lobes but sometimes as long or occasionally slightly longer; stamens arising shortly or well below top of tube, the filaments decurrent on the tube and included or shortly to well exserted.

(Exceptions: Perianth tube tubular and not dilated to the throat in *I. fucata* and sometimes in *I. stohriae*).

Type species: *I. latifolia* De la R.

1. **I. marginifolia** (Salisb.) Lewis comb. nov.

Hyalis marginifolia Salisb. Trans. Hort. Soc. 1: 318. 1812. *Ixia lancea* Jacq. Ic. t. 281. 1786—93 et Coll. Suppl. 13. 1796; non Thunb. 1784.

I. capillaris Thunb. var. *lancea* (Jacq.) Ker in Curtis' Bot. Mag. sub t. 570. 1802. *Morphixia capillaris* (Thunb.) Ker var. *lancea* (Jacq.) Baker, Journ. Linn. Soc. Bot. 16: 97. 1877. *M. lancea* (Jacq.) Klatt, Abh. Naturf. Ges. Halle 12: 383. 1882. *Ixia laurea* Steud. Nomen. ed. 2, 1: 779, 841. 1840, typ. err.

Corm ovoid or subglobose, 1·5—2 cm. diam.; tunics of fairly coarse reticulate fibres usually extending up in a thinnish neck 1·5—7 cm. long. *Stem* 25—75 cm. high, usually 30—50 cm., firm with 4 to several very short filiform more or less flexuose branchlets, sometimes all directed to one side, sometimes patent or suberect. *Basal sheaths* 2, rarely 3, acute or occasionally acuminate, up to 10 cm. long. *Leaves* 3—4, rarely 5, the 2—3 lower lanceolate or ensiform, acute or subacute, varying from falcate to suberect and much shorter than the stem to half or slightly more than half as long, 6—35 cm. long, 0·8—1·8 cm. wide (rarely 5—8 mm.), firm, several-veined, the mid-rib and margins more or less prominent; cauline leaves 1 or 2, entirely or almost entirely sheathing, usually reaching to or above middle of stem. *Spike* laxly 1—3-flowered, the branchlets very short and 1-flowered or slightly longer and 2—3-flowered. *Bract* oblong or ovate-oblong, 0·7—1 cm. long, truncate or shortly 3-lobed, pellucid, colourless or pale mauve-grey, occasionally pale brown near the apex, with 3 dark veins; *bracteoles* 2-veined and shortly bilobed. *Flowers* small, pale blue, mauve or grey-blue, the tube usually greenish; *perianth tube* widely infundibuliform, 4—7 mm. long, rarely slightly exserted from bract; *lobes* about twice as long as the tube, patent, oblong or obovate-oblong, obtuse, 1—1·4 cm. long, 4—7 mm. wide. *Stamens* arising near middle of perianth tube, the filaments decurrent to the base, 5—7 mm. long, exserted; anthers linear or linear-oblong, subsagittate, 3—6 mm. long. *Ovary* rotund, 2·5—3 mm. long; style reaching to middle or nearly to top of anthers, the branches linear, oblanceolate or subspathulate, conduplicate, 2—3 mm. long, minutely ciliate towards the apex.

LECTOTYPE. Jacquin Ic. t. 281.

Western mountain karoo vegetation in the Calvinia, Sutherland, Fraserburg and Laingsburg Divisions.

Flowering period. September—October.

CALVINIA. Near Hollerivier, about 15 miles N.E. of Calvinia on Loeriesfontein road, *Lewis* 2513 (BOL, SAM); *Johnson* 589 (BOL, NBG).

SUTHERLAND. Hills near Sutherland, *Hafstrom* and *Acocks* 308 (PRE, S); mountain 14 miles from Sutherland, c. 5,000 ft., *Acocks* 19600 (PRE, NBG); Komsberg, *Marloth* 9782 (PRE); Verlaten Kloof, Jakhals Valley, *Marloth* 9645 (PRE); farm Fransplaas, *Muller* in Herb. *Marloth* 9898b (PRE).

FRASERBURG. Hills near Fraserburg, *Hafstrom* and *Acocks* 309 (PRE, S).

LAINGSBURG. Tweedside, *Lewis* NBG 2704/32 (BOL.)

As Jacquin's plants in Vienna were destroyed during the war his figure of *I. lancea* is selected as the lectotype. It was pointed out by Ker in the Botanical Magazine in 1802 (sub t. 570) and also by N. E. Brown in 1928 (Journ. Linn. Soc. Bot. 48: 48) that *I. lancea* Jacq. is not the same as *I. lancea* Thunb., the latter being a species of *Tritonia* which Dr. Brown named *T. lancea.* When Salisbury transferred *Ixia lancea* Jacq. to his new genus *Hyalis* in 1812 he gave the name *H. marginifolia* to this species, and since Jacquin's name must be rejected Salisbury's specific epithet is now adopted. In the Kew Index (1895) *Ixia lancea* Jacq. is listed as equal to *Tritonia scariosa* but this is an error and should have been *Ixia scariosa* as there is no *Tritonia* so-named.

The species is allied to *I. capillaris*, with similar flowers, but distinguished by its sturdier habit, much wider leaves and more truncate bracts. It is also closely allied to *I. rapunculoides* but the flowers of *I. marginifolia* have a shorter perianth tube and longer stamens well exserted from the tube and not connivent round the style.

A large number of plants were collected near Sutherland by Mr. Acocks (no. 19600), some of which exactly match Jacquin's figure of *I. lancea.* The leaves of these plants are variable, some very short and more or less falcate and others, probably shade forms from among bushes, much longer and erect as in the plant depicted. In the form from the Calvinia Division (*Lewis* 2513 and *Johnson* 589) the leaves are shorter, narrower and distinctly falcate, with the margins and mid-rib only slightly prominent. According to Jacquin the flowers are very sweetly scented but there is no record of this in any of the collections cited above.

2. **I. capillaris** L. f. Suppl. 92. 1781; Thunb. Diss. Ixia 12. t. 2. f. 2. 1783; N. E. Br. Journ. Linn. Soc. Bot. 48: 45. 1928. *I. capillaris* var. *gracillima* Ker, Bot. Mag. t. 570. 1802. *Morphixia capillaris* (L. f.) Ker, Gen. Irid. 106. 1827. *Ixia gracilis* Salisb. Prod. 37. 1796. *Hyalis gracilis* Salisb. Trans. Hort. Soc. 1: 317. 1812. *Ixia tenella* Klatt, Abh. Naturf. Ges. Halle 12: 396 et Erganz. 62. 1882.

Corm ovoid or subglobose, 1—1·5 cm. diam.; tunics of fine reticulate fibres. *Stem* very slender, usually capillary, 20—45 cm. high, occasionally to 55 cm., simple or with 1—3 very short patent or suberect straight or flexuose branchlets. *Basal sheaths* 2 or 3, the lowest colourless, obtuse, the upper 1 or 2 usually brown towards the apex, acute or subacute. *Leaves* 3, erect, the 2 lower linear or linear-filiform with the margins and mid-rib more or less raised, 6—18 cm. long, 0·5—2 mm. wide, often spirally twisted, seldom reaching above middle of stem; upper leaf longer, usually extending for three-quarters way up the stem, sometimes nearly to the top, sheathing, with a short free linear or filiform tip. *Spike* laxly

1—4-flowered, the rachis sometimes flexuose; branchlets usually 1-flowered but sometimes with 2 or occasionally 3. *Bract* oblong, 0·6—1 cm. long, tridentate, pellucid, colourless, brownish or purplish, with 3 dark veins; *bracteoles* bidentate. *Flowers* white, pale blue or mauve, sometimes pale green at the throat; *perianth tube* infundibuliform, 5—7 mm. long, not or only shortly exserted from the bract; *lobes* oblong, obtuse or subobtuse, 1—1·5 cm. long, 4—6 mm. wide. *Stamens* arising near base of perianth tube, the filaments decurrent to the base, 4—7 mm. long, nearly always exserted, rarely included but if so the anthers 5 mm. long and half exserted; anthers 3—5 mm. long, sagittate. *Ovary* rotund, 2—3 mm. long; style reaching to about middle of anthers, the branches recurved, linear or linear-spathulate, conduplicate, 2—3·5 mm. long.

HOLOTYPE. *Thunberg* in Herb. Thunberg, Uppsala.

Flats, hills and mountain slopes, in sandy or clay soils.

Flowering period. July—September.

CLANWILLIAM. Sandveld, between Greys Pass and Graafwater, *Leipoldt* 3608 (BOL); Elands Kloof, upper S. slopes, *Hafstrom* and *Acocks* 307 (PRE); same, 4,500 ft., *Esterhuysen* 3184 (BOL).

PIKETBERG. Near Berg River Bridge, *L. Bolus* (BOL 20836, K, PRE, SAM).

CERES. Gydouw, *Leipoldt* 3820 (BOL); *Leighton* (BOL 26855); Cold Bokkeveld, 6 miles N. of Gydouw Pass, *Lewis* 2662 (SAM); *Middlemost* 1724 (BOL, NBG); Ezelfontein, *Esterhuysen* 20346 (BOL, PRE); between De Keur and top of Gydouw Pass, *Compton*, NBG 2070/36 (BOL); Groenfontein, *Barker* 3050 (NBG); zwischen Hexriviersberg und Bokkeveld, 3,000—4,000 ft., *Drege* (S).

WORCESTER. Hex River Valley, *Dod* 4017 (BOL); *Esterhuysen* 10348 (BOL); Hex River Mts., 3,500 ft., *Drege* 557 (P); Brandwagt, near foot of mountain, *Van Breda* 675 (NBG, PRE).

MALMESBURY. Riebeek Mt., *Loubser* 456 (NBG).

BELLVILLE. Tygerberg, *Pillans* 4754 (BOL).

PAARL. Groot Drakenstein, *Rogers* 10534 (BOL).

STELLENBOSCH. *Duthie* 1507 (BOL); Simonsberg, *Strey* 555 (PRE); *Rehm* (M).

SOMERSET WEST. Vergelegen, *Johnson* (NBG).

MONTAGU. Eendrag, *Lewis* 1607 (SAM); 5 miles E. of Montagu, *Michell* (BOL 15566); Oudeberg, N.E. of Montagu, *Acocks* 20535 (NBG, PRE).

SWELLENDAM. Near Barrydale, *van Niekerk* 573 (BOL).

RIVERSDALE. Near N. side of Riversdale, *Muir* 3248 (BOL, PRE); *Ferguson*, NBG 2033/35 (BOL).

LADISMITH. S. slopes of Anysberg, 2,500 ft. *Wurts* 1428 (NBG).

LAINGSBURG. Witteberg, 5,000 ft., *Compton* 12243 (NBG).

WITHOUT LOCALITY. *Thunberg* (S, UPS).

The slender hair-like stem, narrow leaves and small delicate flowers, with a short funnel-shaped tube not or only very shortly exserted from the bract, distinguish this species from others in the section. It has a wide range of distribution and, as can be seen from the description, is somewhat variable. N. E. Brown gave a detailed description of Thunberg's type (Journ. Linn. Soc. Bot. 48: 45), and stated that it was not at all like *I. capillaris* var. *gracillima* Ker, illustrated on plate 570 of the Botanical Magazine, but among the collections cited above are a few very delicate plants with only one or two flowers which match this figure.

As was pointed out by Dr. Brown (l. c.), "it bears no resemblance either generically or specifically to *I. linearis* Thunb. (= *Gladiolus linearis* (Thunb.) N. E. Br.) with which Baker has united it in the Flora Capensis, nor is it the same as the specimens quoted by him as being *I. linearis*."

The type of *I. tenella* Klatt, *Zeyher* 557 in Herb. Lubeck, Berlin-Dahlem Herbarium, was destroyed in the last war, but in Klatt's collection in the Stockholm Natural History Museum Herbarium there is an illustration of it, with a laid out flower, and it is the same as the plants named *I. capillaris* by Thunberg. In the Flora Capensis Baker cited *I. tenella* Klatt as a synonym of *I. flexuosa* L.

3. **I. rapunculoides** Del. in Red. Lil. t. 431. 1816. *I. capillaris* Thunb. var. *stricta* Ker, Bot. Mag. t. 617. 1803.

A complex species very variable in stature, size and the rigidity of the leaves and branches, with many different local forms some of which are so distinct that they have been treated as varieties.

KEY TO THE VARIETIES

1. Branches filiform, usually fairly long and straight, often more or less pendulous in living plants.. .. .. *subpendula*
1. Branches almost always flexuose but if not then very short and suberect to erect, varying from filiform to moderately stout.
2. Leaves flaccid; bracts 6—8 mm. long .. .. *flaccida*
2. Leaves usually firm with more or less prominent, often cartilaginous margins, rarely flaccid but if so then the bracts about 1 cm. long.
3. Corm tunics usually extending up in a neck; leaves 4—5 (rarely 6) .. .. *robusta*
3. Corm tunics not extending up in a neck; leaves 2—3 or occasionally 4.
4. Perianth tube 1 cm. long or less.
5. Perianth lobes as long as the tube or up to twice as long; terminal spike nearly always erect and the 4 to several branchlets varying from patent to erect .. *rapunculoides*
5. Perianth lobes slightly shorter than the tube.
6. Stem with 1—5 branchlets, the terminal spike usually declinate and branches somewhat rigid, spreading in a zig-zag manner .. .. .. *rigida*

6. Stem simple or with 1—2 very short branchlets, the terminal spike and branchlets not as above .. *subpendula*
4. Perianth tube more than 1 cm. long.
  7. Terminal spike and branchlets nearly always erect, the branchlets usually very short, occasionally slightly patent above the base .. .. *namaquana*
  7. Terminal spike nearly always declinate; branchlets longer than above and usually spreading stiffly in a conspicuous zig-zag manner .. .. *rigida*

Var. **rapunculoides** (Fig. 1).

Corm ovoid or subglobose, 1—2 cm. diam.; tunics of fairly coarse, often subligneous, reticulate fibres. *Stem* 25—55 cm. high, with 4 to several short filiform flexuose branchlets varying from patent, sometimes horizontal, to erect. *Basal sheaths* 2, colourless, acute, up to 5 cm. long. *Leaves* 3 or occasionally 4, the 2 lower lanceolate or ensiform, much shorter than the stem, up to 1·4 cm. wide, firm, several-veined with prominent margins and mid-rib, the lowest more or less falcate, the second usually shorter and suberect and the cauline leaf usually much longer, reaching to or above the middle of the stem and entirely sheathing; a second shorter sheathing leaf is occasionally present. *Spike* lax, 1—3-flowered; terminal spike erect. *Bract* oblong, 6—8 mm. long, truncate or very shortly 3-lobed or toothed, soft, pellucid, brownish or almost colourless with 3 dark veins; *bracteoles* 2-veined, shortly bilobed or bidentate. *Flowers* fairly small, delicate, pale blue or mauve, the tube usually greenish; *perianth tube* with a short cylindrical base, expanded above and broadly infundibuliform to campanulate, 5—9 mm. long, 5—6 mm. diam. at the throat, usually shortly exserted from the bract; *lobes* patent, oblong, obtuse, 1—1·8 cm. long, 4—7 mm. wide, from as long to twice as long as the tube. *Stamens* arising near middle of perianth tube, connivent in a column round the style, the filaments decurrent to the base of the tube, about 3 mm. long, reaching almost to the throat; anthers slightly to more than half exserted from the tube, linear or linear-oblong, subsagittate, 3—5 mm. long. *Ovary* rotund, 2 mm. long; style reaching to middle or top of anthers, the branches linear or subspathulate, conduplicate, about 1 mm. long, minutely ciliate at the apex.

LECTOTYPE. Red. Lil. t. 431.

Flats in the Calvinia Division at 2,000—3,000 ft. alt., in false succulent karoo or western mountain karoo, and up to 5,000 ft. on the Kamiesberg.

Flowering period. August—September.

NAMAQUALAND. Kamiesberg, Welkom, near Garies, 3,000—4,000 ft., *Esterhuysen* 23700 (BOL); Kamiesberg, between Garies and Leliefontein, *Leipoldt* 3021 (BOL); 3 miles from Leliefontein, 4,300 ft., *Leipoldt* 3606 (BOL); Lilyfontein, 5,000 ft., *Rodin* 1474 (BOL, K, PRE); near Leliefontein, mostly on hills at foot of Eselskop, 4,000—5,000 ft., *Drege* 2640 a (G, K, P).

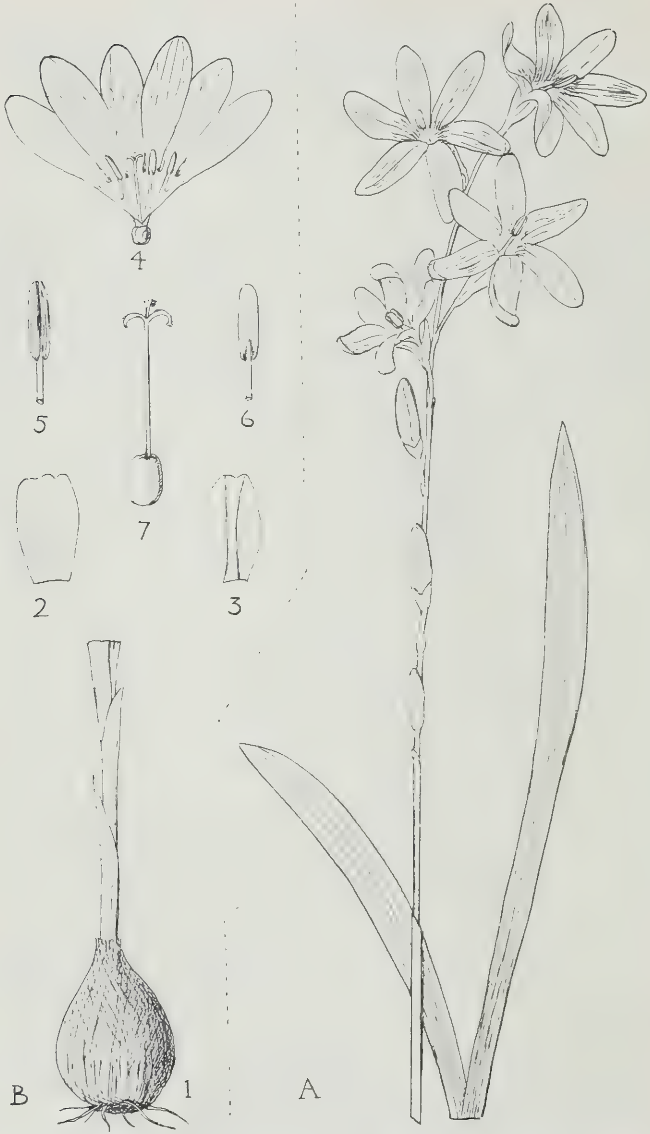


FIG. 1.—*I. rapunculoides.* A. Copied from Bot. Mag. t. 617 (*I. capillaris* Thunb. var. *stricta* Ker). B. *Lewis* No. 5879. 1. Corm and basal sheaths. 2. Bract × 2. 3. Bracteoles × 2. 4. Flower laid open. 5. Stamen, front view, × 3. 6. Stamen, back view, × 3. 7. Gynaecium × 3. Del. G. J. Lewis.

CALVINIA. Bokkeveld, W. of Nieuwoudtville, *Marloth* 7659 (PRE); near Nieuwoudtville, c. 2,000 ft., *Acocks* 14710 (PRE); *L. Bolus* (BOL 19590); 5 miles E. of Nieuwoudtville on Oorlogs Kloof road, *Barker* 6532 (NBG); Oorlogs Kloof, *Barker* 1570 (BOL, NBG); 10 miles along Calvinia-Nieuwoudtville road, *Hardy* 63 (PRE); Calvinia, *Marloth* 12936 (PRE); *Lavis* (BOL 26903); between Middlepost and Calvinia, *Hutchinson* 731 (K); Moordenaarspoort, near Agter Hantamsberg, 26 miles N.E. of Calvinia, *Lewis* 2663 (SAM); Driefontein, S.W. of Calvinia, *Marloth* 10427 (PRE); Bokkeveld, *Watermeyer*, Herb. *Marloth* 5565 (PRE); Wilgebos Farm, near Calvinia, *Lewis* 5879 (NBG).

Baker, Durand and Schinz and others placed *I. rapunculoides* as a synonym of *I. scariosa* Thunb. or *I. incarnata* Jacq., both synonyms of *I. latifolia* De la R., but it differs from that species in having a shorter and comparatively broader perianth tube, often more or less campanulate, with much shorter filaments included within the tube. It is more closely allied to *I. marginifolia* from which it differs in having the perianth tube slightly longer, nearly always shortly exserted from the bract, the stamens connivent round the style with shorter filaments nearly always included in the tube and the anthers usually shorter and included or only partly exserted.

There is no doubt that the amount of rainfall and ecological conditions have played an important part in the development of *I. rapunculoides* and its varieties. Typical plants matching the type figure occur in the vicinity of Calvinia, in what Mr. J. Acocks has termed "False succulent karoo", but in adjoining "western mountain karoo" vegetation the perianth tube shows a tendency to become more elongated and this form merges into the short-tubed form of var. *namaquana*. Some of the plants from the western mountain karoo type of vegetation in the Calvinia Division match the one figured by Ker in the Botanical Magazine as *I. capillaris* var. *stricta* (t. 617), which differs from the type in having shorter, more erect 1-flowered branchlets. In the form from the Kamiesberg the stamens are longer than usual, the filaments 4—6 mm. long and anthers 3—6 mm. long, the former included in the tube and the latter usually half to slightly more than half exserted.

According to Delile the inflorescence flowers from the summit towards the base but there is nothing unusual in the flowering of this species which is typical of the genus and the family. The flowers of the terminal spike open first, from the base upwards, followed successively by the lateral spikes, those near the top of the stem flowering before the lower ones. The impression that the flowering differs in *I. rapunculoides* is due to the fact that the fairly numerous 1—3-flowered spikes are borne on very short branchlets.

Var. **robusta** Lewis var. nov.

Plantae quam var. *rapunculoides* altiores robustiores, foliis 4—5 et spicibus terminalibus et lateralibus ad 6-floris.

Cormus 2—2·5 cm. diam., tunicis subrobustis plerumque in collo circa 5 cm. longo productis, compositis. *Caulis* virgatus, 55—75 cm. altus, ramulis pluribus brevibus suberectis vel erectis 2—6-floris. *Folia* 4—5 (raro 6), quam caulis multo breviora, 2—3 basalia lanceolata vel ensiformia ad 1·6 cm. lata, varietati *rapunculoides* similia sed robustiora, aliquid coriacea. *Flores* pallide lilacino-rosei, varietati *rapunculoides* similes sed interdum paulo majores, tubo ad 1 cm. longo et segmentis ad 2 cm. longis, 9 mm. latis.

Plants taller and more robust than var. *rapunculoides*, with 4—5 leaves and the terminal and lateral spikes up to 6-flowered.

Corm 2—2·5 cm. diam.; tunics moderately coarse, usually extending up in a neck about 5 cm. long. *Stem* virgate, 55—75 cm. high, with several short suberect or erect 2—6-flowered branchlets. *Leaves* 4—5 (rarely 6), much shorter than the stem, the 2—3 basal lanceolate or ensiform, up to 1·6 cm. wide, as in var. *rapunculoides* but firmer and somewhat coriaceous. *Flowers* pale mauve-pink, as in var. *rapunculoides* but sometimes slightly larger, the tube up to 1 cm. long and lobes up to 2 cm. long and 9 mm. wide.

HOLOTYPE. *Lewis* 2503 in South African Museum Herb., National Botanic Gardens, Kirstenbosch.

Stony dolerite slopes in the Calvinia Division, western karoo vegetation.

Flowering period. September—October.

CALVINIA. Moordenaarspoort, near Agter Hantamsberg, 26 miles N.E. of Calvinia, *Lewis* 2503 (BOL, PRE, SAM); near Elandskop, Agter Hantam, c. 2,500 ft., *Acocks* 19038 (PRE).

Although this variety was found within a few hundred yards of var. *rapunculoides* it appeared so distinct that at first I was inclined to think that they were separate species, but after observing it in cultivation I came to the conclusion that the difference in soil had had a marked effect on its growth and that it was only a variety of *I. rapunculoides*. The var. *rapunculoides* was growing in sandy alluvial soil near a stream while var. *robusta* was on hill slopes, in hard gravel soil in pockets among dolerite rocks.

Var. **flaccida** Lewis var. nov.

A varietate *rapunculoides* foliis flaccidis longioribus erectioribus, perianthii tubo paulo longiore et segmentis angustioribus, distinguitur.

Plantae quam var. *rapunculoides* minus robustae, corme ad 1 cm. diam. *Folia* longiora angustiora, plus minusve erecta, flaccida, plerumque minus 1 cm. lata. *Spicae* 1—5-florae, rachide capillari valde flexuoso, spica terminali saepe declinata. *Bractea* 6—8 mm. longa, plus minusve papyracea, alba vel parte dimidia superiore pallide brunnea. *Flores* albi vel subcaerulei vel pallide lilacini; *perianthii tubus* e bractea bene exsertus, 0·8—1·3 cm. longus, in faucibus circa 5 mm. diam.; *segmenta* 0·8—1·4 cm. longa, 2·5—4 mm. lata. *Filamenta* 2—3 mm. longa; antherae 2·5—4 mm. longae.

Distinguished from var. *rapunculoides* by its longer, more erect and flaccid leaves, and flowers with a slightly longer and narrower tube and narrower lobes.

Plants less robust than var. *rapunculoides*, the corm not more than 1 cm. diam. *Leaves* longer and narrower, more or less erect, flaccid, usually less than 1 cm. wide. *Spikes* 1—5-flowered, with a very flexuose capillary rachis, the terminal spike often declinate. *Bract* 6—8 mm. long, more or less papyraceous, white or the upper half pale brown. *Flowers* white, bluish or very pale mauve; *perianth tube* well exserted from the bract, 0·8—1·3 cm. long, about 5 mm. diam. at the throat; *lobes* 0·8—1·4 cm. long, 2·5—4 mm. wide. *Filaments* 2—3 mm. long; anthers 2·5—4 mm. long.

HOLOTYPE. *Schlechter* 8432 in the Bolus Herbarium.

Hills and lower slopes of mountains, often in shady places among rocks in sclerophyllous bush.

Flowering period. July—September.

CALVINIA. About 4 miles N. of Nieuwoudtville on Loeriesfontein road, c. 2,000 ft., *L. Bolus* (BOL 19589); Willemsrivier, *Leipoldt* 803 (SAM).

VANRHYNSDORP. Wiedourivier, between Vanrhynsdorp and Klaver, *Lewis* 1980 (SAM).

CLANWILLIAM. *Marloth* (BOL 10619); near Clanwilliam, *Lewis* (BOL 26904), 1981 (SAM); Olifants River Valley, *Steyn* 497 (NBG); *Penther* 567 (Z), 669 (M, Z); 9 miles S. of Clanwilliam, *Lewis* 5210 (NBG); Boschkloof, *Schlechter* 8432 (BM, BOL, G, L, K, PRE, S, Z).

MONTAGU. Montagu Baths, *Page* (BOL 26905).

LAINGSBURG. Ngaap Kop, 3,800 ft., *Compton* 9272 (NBG).

OUDTSHOORN. Kleinfontein, *Thorne* (SAM 51702).

As in the case of var. *robusta*, soil, aspect and moisture appear to have played an important part in the development of this variety, with its much softer, somewhat narrower and more erect leaves, and more delicate slightly longer and narrower flowers. It occurs in a different type of vegetation from the two previous varieties, in areas with a slightly higher rainfall.

Var. **namaquana** (L. Bolus) Lewis stat. nov. *I. namaquana* L. Bolus, S. Afr. Gard. 21: 368. 1931.

Distinguished from var. *rapunculoides* by its larger bracts and flowers, the perianth tube up to 2 cm. long with the lower third or half cylindrical.

Corm 1—2·5 cm. diam. *Stem* 35—70 cm. high, with 2—7 very short slightly patent to erect straight or flexuose 1—3-flowered branchlets. *Leaves* linear to ensiform, 0·4—1·8 cm. wide. *Bract* 0·8—1·2 cm. long. *Flowers* purple, pale mauve or blue, the tube usually yellowish; *perianth tube* 1·2—2 cm. long, the lower third or half cylindrical and upper part broadly infundibuliform or campanulate, 6—8 mm. diam. at the throat; *lobes* 1·4—2 cm. long, 5—7 mm. wide, as long as the tube or slightly shorter or longer. *Filaments* 3—5 mm. long; anthers 4—4·5 mm. long.

HOLOTYPE. *Bolus* HNAA 698, in the Bolus Herbarium.

Mostly on dry rocky hill slopes in western mountain karoo vegetation but sometimes in adjoining sclerophyllous bush.

Flowering period. August—September.

NAMAQUALAND. Klipfontein, c. 3,000 ft., *Bolus* HNAA 698 (B, BOL, G, K, PRE, SAM, Z); *Marloth* 12678 (PRE); *Compton* 5411 (BOL, NBG); near Steinkopf, *Herre* (STE 11846 in BOL, K); *Lewis* 5494 (NBG).

CALVINIA. Lokenberg, *Esterhuysen* 5755 (BOL, PRE); Nieuwoudtville, *Leipoldt* 822 (BOL); *Buhr* (BOL 20428, K); 4 miles W. of Nieuwoudtville near top of Vanrhyns Pass, *Barker* 6454 (NBG); *Lewis* 2287 (SAM); Bokkeveld, *Marloth* 7656 (PRE); Willemsrivier, *Leipoldt* 793 (SAM); Oorlogs Kloof road, 22 miles E. of Nieuwoudtville, *Lewis* 2502 (SAM); *Barker* 6543 (NBG).

SUTHERLAND. Sneeukrans, *Marloth* 9876 (PRE).

CLANWILLIAM. Citadel Kop, *Compton* 24239 (NBG); road from Pakhuis to Wupperthal, *Leipoldt* (BOL 20772, K); Pakhuis, *Esterhuysen* 5915 (BOL); Wupperthal, *Marloth* 7550 (PRE).

WORCESTER. Between Osplaats and Tunnel Sidings, 2—3,000 ft., *Rogers* 16743 (BOL, Z); near top of Hex River Pass, *Hardy* 48 (PRE).

LAINGSBURG. 19 miles N. of Matjesfontein, c. 3,000 ft., *Acocks* 18440 (PRE).

WITHOUT LOCALITY. *Drege* 2640 b (L).

Due to a printing error in the original description, the type number of *I. namaquana* was given as 648 instead of 698.

Var. *namaquana* occurs mainly in western mountain karoo vegetation, the typical form in a small isolated patch near Steinkopf, but in the Calvinia, Clanwilliam and other districts it occurs also on the margins of adjoining sclerophyllous bush, and in this type of vegetation the plants are much lanker and less robust, with softer, longer and narrower leaves.

The typical Namaqualand form, with its ensiform leaves and long-tubed purple or bluish mauve flowers appears quite distinct from var. *rapunculoides*. Superficially it resembles *I. latifolia*, but it differs in having a wider perianth tube and much shorter stamens entirely or almost entirely included in the tube, also shorter style branches.

The form which occurs in the Calvinia and Clanwilliam Divisions is less robust than the typical, with narrower leaves and paler flowers, usually pale blue or mauve, and in the Calvinia Division this merges into var. *rapunculoides*, with a few intermediates which are difficult to place as the perianth tube is slightly shorter than in var. *namaquana* but longer than is normal in var. *rapunculoides*.

Var. **subpendula** Lewis var. nov. *I. scariosa* var. *longifolia* Baker Handbk. Irid. 165. 1892 et Fl. Cap. 6: 83. 1896, pro parte.

A varietate *rapunculoides* ramis paucioribus longioribus gracillimis saepe plus minusve pendulis (in forma alpina brevioribus vel interdum defectis), floribus campanulatis tubo latiore, distinguitur.

Cormus 1—1·5 cm. diam., tunicis e fibris tenuibus reticulatis compositis. *Caulis* 25—55 cm. altus, filiformis, ramis 1—5 capillaribus plerumque 5—8 cm. longis (in forma alpina brevioribus vel interdum defectis), saepe plus minusve pendulis, infimo interdum ramulis secundariis 1—2. *Folia* 2—4, 2—3 inferiora linearia vel lanceolata, patentia vel suberecta, subrobusta marginibus et nervo medio leviter prominentibus, 10—30 cm. longa, 2—7 mm. lata (raro 1 mm.), supremum longius parte dimidia inferiore vel amplius vaginanti et lamina libera sat longa. *Spica* laxe vel sat dense 2—7-flora. *Bractea* oblonga vel subquadrangularis, 5—7 mm. longa, tridentata vel breviter tricuspidata, saepe apicem versus minute brunneo-punctata. *Flores* campanulati, albi plerumque extus pallide lilacini vel roseo-lilacini vel subcaerulei, tubo et parte dimidia inferiore segmentorum subtiliter purpureo-nervata; *perianthii tubus* 0·9—1·3 cm. longus, in faucibus 0·6—1 cm. diam.; *segmenta* supra medium patentia, oblonga vel oblongo-ovata tubo circa aequantia vel leviter breviora vel longiora, 4—6 mm. lata.

Differs from var. *rapunculoides* in having fewer and longer very slender, often more or less pendulous branches (shorter or sometimes wanting in the high mountain form), and the flowers distinctly campanulate with a wider tube.

Corm 1—1·5 cm. diam.; tunics of fine reticulate fibres. *Stem* 25—55 cm. high, filiform, with 1—5 capillary branches usually 5—8 cm. long (in alpine form shorter or sometimes wanting), often more or less pendulous in living plants, straight and patent to erect when dried, the lowest sometimes bearing 1 or 2 secondary branchlets. *Leaves* 2—4, the lower

2 or 3 linear or lanceolate, 10—30 cm. long, 2—7 mm. wide (rarely 1 mm.), patent or suberect, fairly firm with the margins and mid-rib slightly prominent; upper leaf longer than others, half or more than half sheathing with a fairly long free blade. *Spike* laxly to fairly closely 2—7-flowered, the terminal spike often pendulous like the branches. *Bract* oblong or subquadrangular, 5—7 mm. long, tridentate or shortly tricuspidate, often minutely speckled with brown at the apex. *Flowers* campanulate, white usually tinged with pale mauve outside, pinkish mauve or pale blue, the tube and lower half of the lobes finely veined with purple outside; *perianth tube* 0·9—1·3 cm. long, 0·6—1 cm. diam. at the throat; *lobes* patent above the middle, oblong or oblong-ovate, about as long as the tube or slightly shorter or longer, 4—6 mm. wide. *Androecium* and *gynaecium* as in var. *rapunculoides*.

HOLOTYPE. *Leipoldt* 3026 in the Bolus Herbarium.

Marshy or sandy ground on mountain slopes.

Flowering period. October—December.

CLANWILLIAM. Between Groot Rivier and Elands Kloof, *Leipoldt* 3026, 3058 (BOL); Cedarberg, *Thode* A 2079 (PRE).

CERES. Near Ceres, *Bolus* 2621 (BOL, SAM); top of Michells Pass, *Marloth* 10692 (PRE); Michells Peak, 5,000 ft., *Esterhuysen* 14795 (BOL); Conical Peak, *Stokoe* (SAM 55766); Matroosberg, near Laaken Vlei, *Phillips* (SAM 11876); Gydouw, *Leipoldt* 3057 (BOL); foot of Skurfteberg, *Esterhuysen* 21869 (BOL); Elands Kloof, *Barker* 3094 (BOL, NBG); near Waboomsrivier, *Lewis* 2752 (SAM).

TULBAGH. Steendal, *Pappe* (SAM 20937); Great Winterhoek, c. 4,600 ft., *Phillips* 1874 (SAM); Sneeugat Valley, *Thorne* (SAM 50404); Windheuvel, Koedoes Mts., *Burchell* 1285 (K); Tulbagh, *Ecklon* and *Zeyher* 94 (BOL, K. PRE, Z).

WORCESTER. Waaihoek Mt., 5,000 ft., *Esterhuysen* 8344 (BOL); Milner Peak, Hex River Mts., 6,000 ft., *Esterhuysen* 14234 (BOL); same, shale band above Buffels Dome, 5,500 ft., *Esterhuysen* 9327 (BOL); Matroosberg, 7,000 ft., *Marloth* 2266 (PRE).

This very distinct variety, with hair-like often pendulous branches and campanulate flowers, has the appearance of a *Dierama*. Except in the alpine form the branches are considerably longer than in the varieties described above and although they always appear straight in herbarium specimens they are very often more or less pendulous in living plants. The form from high altitudes flowers from November to December and the plants are usually smaller, with only two leaves and usually not more than one or two short erect branchlets.

In the Flora Capensis Baker cited two collections under *I. scariosa* var. *longifolia*, the first, *Bolus* 2621, being the variety described above but the second, *Bolus* 2487, from Avontuur, is *I. orientalis* L. Bolus. One of the collections he cited under *I. scariosa, Ecklon* and *Zeyher* 94, is this variety, and the correct locality is Tulbagh, not "Karoo near Gouritz River."

Var. **rigida** Lewis var. nov.

A varietate *rapunculoides* ramis paucioribus robustioribus paulo vel valde longioribus, perianthii tubo longiore et segmentis brevioribus latioribus differt.

Caulis 15—60 cm. altus, spica terminali flexuosa saepe plus minusve declinata, ramis 1—5 rigidis patentibus parte dimidia inferiore interdum horizontali superne plerumque caulem versus incurva. *Folia* 3, varietati *rapunculoides* similia. *Spicae* sat dense 3—7-florae, interdum secundae. *Bractea* varietati *rapunculoides* similis. *Flores* rosei vel lilacini vel caerulei vel purpurei, perianthii tubo plerumque luteo 1—1·5 cm. longo in faucibus 0·6—1 cm. diam.; *segmenta* oblonga vel suborbicularia obtusa, 0·8—1·4 cm. longa, 5—8 mm. lata, quam tubus leviter breviora, supra basin patentia.

Differs from var. *rapunculoides* in having fewer branches which are slightly to much longer and more rigid, the perianth tube slightly longer and wider, and comparatively shorter and wider lobes.

Stem 15—60 cm. high, with the terminal spike flexuose, often more or less declinate, and 1—5 stiff patent branches with the lower half sometimes horizontal and upper part usually curved in towards the stem, having a zig-zag appearance. *Leaves* 3, as in var. *rapunculoides*. *Spikes* fairly closely 3—7-flowered, sometimes secund. *Bract* as in var. *rapunculoides*. *Flowers* pinkish, pale mauve, blue or purplish, the tube usually yellow; *perianth tube* 1—1·5 cm. long, 0·6—1 cm. diam. at the throat; *lobes* oblong or suborbicular, obtuse, 0·8—1·4 cm. long, 5—8 mm. wide, slightly shorter than the tube, patent above the base. *Androecium* and *gynaecium* as in var. *rapunculoides*.

Holotype. *MacOwan* HAA 1653 in the South African Museum Herb., National Botanic Gardens, Kirstenbosch.

Sandy flats and valleys in the Clanwilliam, Ceres and Worcester Divisions.

Flowering period. September—October.

CLANWILLIAM. Matjes River Valley, 2 miles from top of Uitkyk Pass, *Gillett* 4108 (BOL, PRE); Welbedacht Kloof, *Stokoe* (SAM 55666).

CERES. Cold Bokkeveld, *Marloth* 10610, 10613 (PRE); *Lewis* 2661 (SAM); South Cold Bokkeveld, *Bond* 645 (NBG); Gydouw Pass, *Marloth* 12965 (PRE); *Lewis* NBG 2079/36 (BOL): *Leipoldt* 3023 (BOL, NBG, PRE, SAM); 3821 (BOL, PRE); Jakhals Nest, *Barker* 3033 (NBG).

WORCESTER. Hex River Valley, *MacOwan* HAA 1653 (G, K, SAM, Z) (in BOL under *Guthrie* 3077).

The flowers of this variety are very similar to those of var. *subpendula* but the plant differs in having a more rigid habit, with stiff flexuose branches and a somewhat zig-zag appearance. Its habit is that of *I. latifolia* var. *curviramosa* but it is readily distinguished by its campanulate flowers which have a much wider perianth tube and short stamens not exserted from the tube.

4. **I. brunneobractea** Lewis sp. nov.

Cormus ovoideus vel subglobosus, 0·7—1 cm. diam., tunicis e fibris subrobustis parallelis erectis supra medium confluentibus et plus minusve reticulatis, compositis. *Caulis* gracilis, 25—45 cm. altus, plerumque spica terminali declinata, simplex vel ramulis brevissimis 1—2 patentibus flexuosis. *Vaginae basales* 2, acutae, ad 9 cm. longae, molles. *Folia* 3, 2 inferiora linearia vel lineari-lanceolata, erecta vel infimum falcatum, circa ad medium caulis attingentia, 2—5 mm. lata, subrobusta nervo medio et marginibus leviter prominentibus, supremum longius, vaginans lamina libera 0·5—5 cm. longa. *Spica* brevis, terminalis et laterales dense 2—5-flora. *Bractea* ovata vel oblonga, tridentata, 0·7—1 cm. longa, castanea lucida mollis, interdum apice lacerata; *bracteolae* 2-nervatae bidentatae. *Flores* campanulati, gilvi vel interdum lobis exterioribus pallide lilacinis; *perianthii tubus* e bractea non vel breviter exsertus, basin versus cylindricus, superne campanulatus, 5—7 mm. longus; *segmenta* oblonga obtusa, 1—1·5 cm. longa, 5—8 mm. lata. *Stamina* in perianthii tubo medium versus orta, filamentis exsertis decurrentibus, 6—8 mm. longis, et antheris lineari-oblongis sagittatis, 4—5 mm. longis. *Ovarium* rotundum, 2 mm. longum; stylus ad medium antherarum attingens, ramis linearibus conduplicatis circa 2 mm. longis.

Corm ovoid or subglobose, 0·7—1 cm. diam.; tunics of moderately coarse fibres, vertical below, becoming confluent and more or less reticulate above. *Stem* slender, 25—45 cm. high, the terminal spike often declinate, simple or with 1—2 short patent flexuose branchlets. *Basal sheaths* 2, acute, up to 9 cm. long, soft and often partly or entirely disintegrated at time of flowering. *Leaves* 3, the 2 lower linear or linear-lanceolate, erect or the lower falcate, about half as long as the stem, 2—5 mm. wide, fairly firm with the mid-rib and margins slightly prominent; third leaf slightly or much longer, sheathing with a short free blade 0·5—5 cm. long. *Spike* short, the terminal and lateral closely 2—5-flowered. *Bract* ovate or oblong, 0·7—1 cm. long, tridentate, chestnut-brown, shining, usually with 3 dark veins, becoming torn at the apex as the flower opens; *bracteoles* 2-veined, bidentate. *Flowers* campanulate, cream-coloured or the outer lobes occasionally pale mauve, the tube yellow inside; *perianth* *tube* not or very little exserted from bract, cylindrical at the base, campanulate above, 5—7 mm. long; *lobes* oblong, obtuse, 1—1·5 cm. long, 5—8 mm. wide. *Stamens* arising near middle of tube, exserted, the filaments decurrent, 6—8 mm. long; anthers linear-oblong, sagittate, 4—5 mm. long. *Ovary* rotund, 2 mm. long; style reaching to middle of anthers, the branches linear, conduplicate, about 2 mm. long, minutely papillose-fimbriate towards the apex.

HOLOTYPE. *Barker* 9555 in the Compton Herbarium, Kirstenbosch.

Marshy places near the western borders of the Calvinia Division at about 2,000—3,000 ft. alt.

Flowering period. September—October.

CALVINIA. 5 miles N. of Nieuwoudtville on Grasberg road, *Barker* 9555 (NBG); Nieuwoudtville, *Leipoldt* 790 (BOL); Nieuwoudtville and Groenrivier, *Leipoldt* 803 (BOL); Bokkeveld above Vanrhynsdorp, *Marloth* 13341 (PRE); Willemsrivier, *Leipoldt* 793 (SAM).

The shining chestnut-coloured bracts, sometimes torn at the apex, distinguish this species from all others in the section. It is allied to *I. capillaris* but as well as the different bracts it has slightly wider leaves and the spikes are more compact and usually have more flowers.

5. **I. latifolia** De la R. Descr. Pl. Nov. 22. 1766; Klatt, Abh. Naturf. Ges. Halle 12: 397 et Erganz. 63. 1882. *I. incarnata* Jacq. Ic. t. 282. 1786—93 et Coll. Suppl. 13. 1796; Dur. & Schinz, Consp. Fl. Afr. 5: 184. 1895. *I. aulica* Ait. Hort. Kew. 1: 57. 1789. *I. capillaris* L. f. var. *incarnata* (Jacq.) Ker, Bot. Mag. 617. f. inf. 1803. *I. capillaris* var. *aulica* (Ait.) Ker, Bot. Mag. t. 1013. 1807. *I. scariosa* Thunb. Fl. Cap. 243. 1811; Baker, Handbk. Irid. 165. 1892 et Fl. Cap. 6: 83. 1896, pro parte. *I. phlogiflora* Red. Lil. t. 432. 1816. *I. capitata* var. *stellata* Andr. Bot. Rep. t. 232. 1802. *I. stellata* (Andr.) Klatt, Abh. Naturf. Ges. Halle 12: 396 et Erganz. 62; Dur. & Schinz, l. c. 186. *Hyalis latifolia* (De la R.) Salisb. Trans. Hort. Soc. 1: 317. 1812. *H. aulica* (Ait.) Salisb. l. c. 318. *Morphixia aulica* (Ait.) Ker, Gen. Irid. 107. 1827. *M. incarnata* (Jacq.) Ker, l. c *Geissorhiza latifolia* (De la R.) Baker, Journ. Linn. Soc. Bot. 16: 94. 1877 Handbk. Irid. 156 et Fl. Cap. 6: 72; Dur. & Schinz, l. c. 179. *Tritonia latifolia* (De la R.) N.E. Br. Kew Bull. 1929. 135.

KEY TO THE VARIETIES

1. Leaves 2—4 mm. wide or occasionally to 5 mm... .. .. *angustifolia*
1. Leaves 0·5—2 cm. wide.
    2. Stem and branches straight or nearly so, seldom slightly curved or flexuose .. .. *latifolia*
    2 Branches, and often the terminal spike, distinctly curved or flexuose.

3. Branchlets usually several, very short; occurs only in Namaqualand .. .. *ramulosa*
3. Branchlets usually 1—3; does not occur in Namaqualand.
    4. Branchlets curved with the spikes erect or curved in towards the stem; flowers usually 2 cm. or more long *curviramosa*
    4. Branchlets and terminal spike much twisted and more or less declinate; flowers usually less than 2 cm. long .. *parviflora*

Var. **latifolia**

Corm ovoid or subglobose, 1·5—2·5 cm. diam.; tunics of fairly coarse dark brown fibres, vertical below becoming reticulate above the middle. *Stem* 15—50 cm. high (occasionally to 60 cm.), slender to moderately stout, usually with 1—3 short suberect or patent branches. *Basal sheaths* 2, the lower colourless, 1—3 cm. long, the upper brownish towards the apex, up to 10 cm. long, acute. *Leaves* 3, firm, the 2 basal lanceolate or ensiform, acute or subacute, 0·8—2 cm. wide, several-veined with the mid-rib and margins slightly to distinctly prominent and cartilaginous, the lower falcate or straight and suberect or erect, 8—28 cm. long, the second straight, suberect or erect, as long as the lower or up to 10 cm. longer; cauline leaf longer than the 2 basal, partly to almost entirely amplexicaul, reaching to middle of stem or above, sometimes up to the inflorescence. *Spike* laxly to fairly closely 3—7-flowered, the rachis more or less flexuose. *Bract* oblong or sometimes obovate, 0·8—1·4 cm. long, tridentate, tricuspidate or with a short cusp and 2 short teeth, usually pellucid and brownish with 3 dark veins, sometimes purplish or almost colourless; *bracteoles* bicarinate, bicuspidate. *Flowers* pale mauve, pinkish mauve or pale to bright pink or magenta, usually green or yellowish green inside the tube; *perianth tube* 1—2 cm. long, infundibuliform, the upper half gradually expanded from about 1 mm. diam. to 4—7 mm. diam. at the throat; *lobes* patent, equal, oblong, obtuse, 1·1—2 cm. long, 5—9 mm. wide, as long as the tube or slightly shorter or longer. *Stamens* arising below the throat, the filaments decurrent on the tube, well exserted, 0·8—1·2 cm. long, connivent round the style; anthers linear-oblong, 4—5 mm. long. *Ovary* oblong or rotund, about 3 mm. long; style reaching to middle or top of anthers or shortly above them, the branches recurved, oblanceolate, conduplicate, 2—3 mm. long, with the upper third minutely ciliate.

Holotype. *Burmann* in Herb. Delessert, Geneva.

Sandy flats and mountain slopes in the Ceres and adjoining Divisions.

Flowering period. September—October.

CALVINIA. Between Oorlogs Kloof and Papkuilsfontein, *Leipoldt* 3020, 3022 (BOL).

CLANWILLIAM. Elands Kloof, *Thomas* (NBG).

CERES. Cold Bokkeveld, *Thunberg* (UPS, type of *I. scariosa*);

Leipoldt (BOL 26909); *Marloth* 10608 (PRE); *Ingram* (K); Cold Bokkeveld, 3 miles S. of Leeuwrivier, *Lewis* 2512 (PRE, SAM); Cold Bokkeveld, 35 miles N. of Ceres, *Middlemost* 1727 (NBG); Gydouw, *Leipoldt* 3024 (BOL), 4070 (NBG, PRE); 7 miles W. of Gydouw Pass, *Hutchinson* 1048 (K); De Keur, *Compton* 9716 (NBG); Prince Alfreds Hamlet, *Olivier* (NBG); *Lewis* 2660 (SAM); *Johnson* 494 (NBG); Groenfontein, *Barker* 3045 (NBG); Theronsberg, *Marloth* 3318 (PRE); road to Theronsberg, *Marloth* 6164 (PRE); Laaken Vlei, *Barker* 1569 (NBG); *Compton* 12063 (NBG); Hottentots Kloof, *Barker* 1563, 3021 (NBG); between Karoopoort and Ceres, *Dymond*, NBG 1966/33 (K, PRE); near Ceres, *Barker* 1568 (NBG); Ceres Wild Flower Show (BOL 14278, K); *Barker* 309 (NBG); *Lewis* (SAM 61741, 61742); *Lavis* (BOL 26907, 26913); Karoopoort, *L. Bolus* (BOL 19887, 26908).

WORCESTER. Tafelberg, 3,000 ft., *Pillans* (BOL 14141); Hex River Valley, *Zinn* (SAM 67322); Hex River, 1,000 ft., *Drege* 581 (G, P).

Without Locality. *Burmann* (G); *Drege* 3499 a (P); *Pappe* (S); *Zeyher* 581 (S, drawing and flowers in Klatt's Herb.); *Brehm* 824 (M).

Some idea of the confusion about this species can be gathered from the nomenclature. Baker, who knew it only from the original description, transferred *I. latifolia* to *Geissorrhiza*, as a doubtful species, while N. E. Brown, who examined the type, stated that it was a distinct species of *Tritonia* which he could not match at Kew. When I first saw the type in Geneva in 1949 I noted that it was the same as the species known in South Africa as *I. incarnata* Jacq. (syn. *I. scariosa* Thunb.). Since then, through the courtesy of Prof. C. Baehni, Director of the Jardin Botanique in Geneva, the type has been sent here for comparison with material from other herbaria and there is no doubt at all that *I. incarnata* Jacq. and *I. scariosa* Thunb. are the same as *I. latifolia* De la R., and the name *I. latifolia* being the first by which it was known, must therefore be restored to the species. In Kew Herbarium there are some specimens from the Ceres Wild Flower Show (Bolus Herb. No. 14278), on which N. E. Brown noted "exactly matches type of *I. scariosa* Thunb." As well as having seen Thunberg's type, I have compared Bolus Herbarium No. 14278 with the type of *I. latifolia* and found them to be an excellent match.

De la Roche described the stem as simple but in the type it is just possible to see a branch enclosed within the cauline leaf—the specimen was picked before it was far enough developed to emerge.

In addition to the varieties described below, all of which differ fairly markedly from var. *latifolia* and from each other, there are a few distinct local forms of the var. *latifolia*. One of these, from Prince Alfreds Hamlet, has longer more filiform branches than usual and pale mauve, sometimes almost white, flowers with a shorter tube than usual. Another, with smallish pink flowers with the tube greenish yellow and shorter than in the type, matches the plant figured by Andrew in 1802 as *I. capitata* var. *stellata* (Andr. Bot. Rep. t. 232). Although the perianth tube can be seen to be funnel-shaped in Andrew's figure, it was taken to be cylindrical by both Klatt and Baker. The former raised it to specific status as *I. stellata* (Andr.) Klatt, but one of the specimens I have seen to which he gave this name is *I. patens* Ait. In the Flora Capensis Baker cited *I. capitata* var. *stellata* as a synonym of *I. flexuosa* L. (p. 78), and in the same work placed *I. stellata* (Andr.) Klatt as a variety of *I. ovata* Klatt (p. 82)!

Baker cited *I. striata* Vahl. Enum. 2: 65 (1806) as a synonym of *I. scariosa* but from Vahl's description it is doubtful if this is correct, and as his type has not been seen its identity remains uncertain.

Var. **angustifolia** Lewis var. nov.

A var. *latifolia* foliis angustioribus, plerumque minus 5 mm. latis, distinguitur.

Cormus 0·6—1·2 cm. diam., tunicis e fibris tenuibus reticulatis compositis. *Folia* 3—4, raro 5, linearia vel lineari-lanceolata, plerumque 2—4 mm. lata, raro ad 5 mm. Planta ceteroqui var. *latifoliae* similis sed caule saepius simplici, spica interdum 1—2-flora et bracteis 5—8 mm. longis.

Distinguished from var. *latifolia* by its narrower leaves, usually less than 5 mm. wide.

Corm 0·6—1·2 cm. diam., tunics of fine reticulate fibres. *Leaves* 3—4, rarely 5, linear or linear-lanceolate, usually 2—4 mm. wide, occasionally to 5 mm. Plant otherwise as in var. *latifolia* but the stem more often simple, the spike sometimes 1- or 2-flowered and the bracts 5—8 mm. long.

HOLOTYPE. *Pillans* 9790 in the Bolus Herbarium.

Fairly high altitudes on mountains in the Clanwilliam, Tulbagh, Ceres, Paarl and Stellenbosch Divisions.

Flowering period. October—December or early January.

CLANWILLIAM. Cedarberg, *Thode* A 2080 (PRE); *Jackson* (NBG); *Taylor* 1850 (NBG); Elands Kloof, *Lewis* (BOL 26940).

CERES. Witzenberg, east face, *Pillans* 9790 (BOL); Skurfteberg Pass, *Compton* 22277 (NBG).

TULBAGH. Witzenberg Vlakte, *Leighton* 2295 (BOL); slopes of Witzenberg, about 5,000 ft., *Phillips* 1875 (SAM); Tulbagh, *Pappe* (SAM 20937).

PAARL. French Hoek, mountains, *Esterhuysen* 11199 (BOL); Wemmershoek Peak, 5,500 ft., *Esterhuysen* 11268 (BOL); *Lewis* 853 (SAM); mountains S. of Wemmershoek, *Andreae* 736 (PRE).

STELLENBOSCH. Victoria Peak, 4,500 ft., *Esterhuysen* 9763 (BOL).

Without Locality. *Thunberg* (S, named *I. tenuifolia* Vahl by Klatt).

A slender late-flowering alpine variety. Plants from the Bredasdorp Mts., *Hafstrom* and *Acocks* 2073 (S, PRE), are nearest to this variety but the bracts are shorter, the perianth tube is more slender than usual, about 3 mm. diameter at the throat, and there is a dark circular ring of colour in the middle of the flower. When more material becomes available it might prove to be a new species.

Var. **curviramosa** Lewis var. nov.

A var. *latifolia* ramis brevibus rigidis curvis distinguitur.

Caulis plerumque 10—30 cm. altus (interdum ad 40 cm.), fere semper ramis brevibus rigidis parte dimidia inferiore patente et spica erecta vel caulem versus incurva, rachide spicae terminalis etiam saepe ramorum valde flexuoso. *Folia* var. *latifoliae* similia sed breviora, interdum obtusa vel subobtusa. *Bractea* ad 1 cm. longa. *Flores* albi vel pallide lilacini segmentis sat conspicue nervatis, vel rubido-purpurei, plerumque quam var. *latifolia* minores, perianthii tubo ad 1·4 cm. longo (plerumque minus) et segmentis ad 1·5 cm. longis circa tubo aequantibus.

Distinguished from var. *latifolia* by its stiff short curved branches.

Stem usually 10—30 cm. high (sometimes up to 40 cm.), almost always branched, the branches short and stiff with the lower half patent and the spike upcurved and erect or curved in towards the stem, the rachis of the terminal spike, often the branches also, very flexuose. *Leaves* as in var. *latifolia* but shorter, sometimes obtuse or subobtuse. *Bract* up to 1 cm. long. *Flowers* whitish or pale mauve with the lobes somewhat conspicuously veined, or magenta, usually slightly smaller than in var. *latifolia*, the perianth tube up to 1·4 cm. long (usually less) and lobes up to 1·5 cm. long, about as long as the tube.

Holotype. *Barker* 7469 in the Compton Herbarium, Kirstenbosch.

Sandy flats and mountain slopes in the Ceres, Worcester, Montagu and Laingsburg Divisions.

Flowering period. September—October.

CERES. Gydouw, *Leipoldt* 3025 (BOL); 8 miles N. of Ceres, *Johnson* 492 (NBG); Cold Bokkeveld, *Marloth* 10624 (PRE); Ceres Wild Flower Show (BOL 26911); *Barker* (BOL).

WORCESTER. Between Ouberg Pass and Touwsrivier, *Dymond*, NBG 1965/33 (BOL, K, PRE, SAM).

MONTAGU. Rabiesberg, *Compton* 5680 (NBG); *Lewis* (BOL 26910); Eendrag, 4,000 ft., *Compton* 18526 (NBG); *Lewis* 1606 (SAM); Montagu Div., *Leipoldt* (BOL 21831, K).

LAINGSBURG. Tweedside, *Barker* 7469 (NBG); *Compton* 3143 (BOL, K); *Lewis*, NBG 2705/32 (BOL, K); Witteberg, *Leighton* 227 (BOL);

same, 4,500 ft., *Compton* 13987, 15200 (NBG); Elandsfontein, Witteberg, *Compton* 3810 (BOL, NBG); Seven Weeks Poort, north end, 3,000 ft., *Wurts* 1165 (NBG); same, 4—5,000 ft., *Phillips* 1545 (BOL, SAM).

This variety, which occurs in dry areas mostly in or near the borders of the Karoo, is easily recognised by its stiff curved and often flexuose branches and slightly smaller flowers. The plants are usually shorter and sturdier than in var. *latifolia*, and in dry seasons are sometimes only about 10 cm. high, though even these dwarf plants are almost invariably branched. There are two distinct colour forms, one with dark magenta and the other with pale mauve or whitish flowers usually with somewhat conspicuous darker veins on the lobes.

Var. **parviflora** Lewis var. nov.

Var. *curviramosae* similis sed spica terminali ramisque plus flexuosis, saepe declinatis, et floribus minoribus.

Caulis 10—20 cm. altus, spica terminali et ramis brevibus 1—2 valde flexuosis, saepe declinatis. *Flores* punicei vel violacei, odorati, 1·5—2 cm. longi (ovario incluso), perianthii tubo 6—8 mm. longo, raro e bractea non exserto.

Similar to var. *curviramosa* but the terminal spike and branches more flexuose, often declinate, and the flowers smaller.

Stem 10—20 cm. high, the terminal spike and 1—2 short branches extremely flexuose, often declinate. *Flowers* deep pink to violet, fragrant, 1·5—2 cm. long (including ovary), the perianth tube 6—8 mm. long, occasionally not exserted from the bract.

HOLOTYPE. *Compton* 5592 in the Compton Herbarium, Kirstenbosch.

Only recorded from the Karoo Garden, Whitehill.

Flowering period. August—September.

LAINGSBURG. Karoo Garden, Whitehill, 2,700 ft., *Compton* 2873 (BOL, NBG), 5592, 11208, 14840 (NBG); *L. Bolus* (BOL).

A dwarf small-flowered variety with very flexuose twisted branches. It closely resembles the dark colour form of var. *curviramosa* but the flowers are sweet-scented, "like *Freesia*", and the flowering period is a month earlier.

Var. **ramulosa** Lewis var. nov.

A var. *latifolia* ramulis pluribus brevioribus, perianthii tubo paulo breviore styli ramis brevioribus, distinguitur.

Caulis 15—70 cm. altus, plerumque 30—40 cm., ramulis pluribus brevibus patentibus vel erectis flexuosis. *Folia* var. *latifoliae* similia, 0·5—1·5 cm. lata. *Spica* sat laxe 1—3-flora, raro ad 5-flora. *Flores* purpurei vel lilacini, tubo plerumque intrinsecus viridi e bractea breviter exserto, 0·8—1 cm. longo, parte dimidia superiore aliquid subito ampliata et late infundibuliformi; *segmenta* 1·2—1·7 cm. longa, 5—8 mm. lata. *Stamina* infra fauces circa 3 mm. orta, filamentis bene exsertis 0·6—1 cm. longis et antheris 4—5 mm. longis. *Styli rami* 1—1·5 mm. longi, spathulati vel lineares apicem versus leviter ampliati et ciliati.

Distinguished from var. *latifolia* by the more numerous shorter branchlets, the slightly shorter and comparatively broader perianth tube and shorter style branches.

Stem 15—70 cm. high, usually 30—40 cm., with several short patent to erect flexuose branchlets. *Leaves* as in var. *latifolia*, 0·5—1·5 cm. wide. *Spike* fairly laxly 1—3-flowered, rarely up to 5-flowered. *Flowers* purple or mauve, the tube usually greenish inside; *perianth tube* shortly exserted from bract, 0·8—1 cm. long, the upper half somewhat abruptly expanded and broadly infundibuliform; *lobes* 1·2—1·7 cm. long, 5—8 mm. wide. *Stamens* arising about 3 mm. below throat, the filaments well exserted, 0·6—1 cm. long; anthers 4—5 mm. long. *Style branches* 1—1·5 mm. long, spathulate or linear with the apex slightly expanded and ciliate.

HOLOTYPE. *Lewis* 1372 in the South African Museum Herb., National Botanic Gardens, Kirstenbosch.

Sandy soil in broken veld or rolling granite country in Namaqualand.

Flowering period. August—September.

NAMAQUALAND. Groot Vlei, W. of Kamieskroon, *Lewis* 1372, 4439 (SAM); *Acocks* 19459 (M, NBG, PRE); *Barker* 1567, 3712 (BOL, NBG), 8411 (NBG); *Middlemost* 1647 (NBG); *Compton* 6608 (NBG); *Leighton* 1216 (BOL, PRE); between Grootvlei and Kamieskroon, *Martin* 527 (NBG); Kamieskroon, *Esterhuysen* 5711 (BOL, PRE); between Garies and Kamieskroon, *Herre* (STE 3762 in BOL); Brakdam, *Martin* 827 (NBG); N. of Darters Grave, *Barker* 6750 (NBG).

Apart from the more numerous and shorter branchlets and other characters mentioned above, the colour of the flowers in this variety, usually purple but sometimes mauve, distinguishes it from var. *latifolia*. A form of var. *curviramosa* from the Cold Bokkeveld, with deep magenta flowers and a shorter tube than usual, closely resembles var. *ramulosa* in the dried state, though the plants are almost always considerably shorter.

6. **I. leipoldtii** Lewis, Ann. S. Afr. Mus. 40: 121. 1954.

Corm globose, 1—1·4 cm. diam.; tunics of moderately fine vertical confluent fibres. *Stem* 11—25 cm. high, simple or with 1—2 short suberect branches. *Basal sheaths* 1 or 2, 1·5—4·5 cm. long. *Leaves* 3, lanceolate, somewhat coriaceous with the mid-rib and margins fairly prominent, 7—20 cm. long, 3—5 mm. wide, the lowest falcate or subfalcate, the second suberect and third erect and entirely or almost entirely sheathing. *Spike* short, closely 2—4-flowered. *Bract* ovate, 0·7—1 cm. long, tricuspidate or sometimes with a single cusp, pellucid, brownish or brownish purple, 3 or

5-veined; *bracteoles* as long as bract or slightly longer. bicarinate, shortly bicuspidate. *Perianth tube* yellow, 1—1·2 cm. long, filiform at the base, the upper half infundibuliform, 5—6 mm. diam. at the throat; *lobes* equal, white with the lower third claret-coloured, orbicular or suborbicular, 1·5—1·7 cm. long, up to 1·4 cm. wide, with a very short broad claw. *Stamens* arising in the perianth tube, the filaments decurrent, 3—4 mm. long, not exserted; anthers 3—4 mm. long, the upper half or three-quarters exserted. *Ovary* ovoid, 3 mm. long; style reaching to top of filaments, the branches subspathulate, conduplicate, about 2 mm. long.

HOLOTYPE. *Leipoldt* in the Bolus Herbarium (No. 21808).

Karroid broken veld vegetation.

Flowering period. September.

SWELLENDAM. Vlakte near Barrydale, 2,300 ft., *Levyns* 545 (CT).

PRINCE ALBERT. Eikerkraal, between Prince Albert and Klaarstroom, *Leipoldt* (BOL 21808, SAM).

Although a bright, contrasting patch of colour at the base of the perianth lobes is common in the section *Ixia*, it is rare in the section *Morphixia*, to which this species, with its distinctly funnel-shaped perianth tube, belongs. The lobes are white with a conspicuous claret-coloured patch at the base and short veins of the same colour extending up into the base of the white part. Another character which distinguishes this species is the width of the almost orbicular lobes; in most other species in the section they are more or less oblong.

7. **I. pauciflora** Lewis sp. nov.

Cormus ovoideus vel subglobosus, 1—1·8 cm. diam., tunicis e fibris fuscis subrobustis reticulatis plerumque in collo 1—2·5 cm. longo productis, compositis. *Caulis* filiformis, 22—38 cm. altus, simplex vel ramulis 1—2 brevissimis minus 1 cm. longis. *Vaginae basales* 2, membranaceae, brunneae, ad 12 cm. longae. *Folia* 3, 2 inferiora linearia vel lineari-filiformia, circa ad medium caulis attingentia, 0·5—1 mm. lata, firma nervo medio et marginibus sat prominentibus, supremum longius omnino vaginans. *Spica* terminalis laxe 1—2-flora (raro 3), laterales 1-flora. *Bractea* oblonga, breviter tricuspidata, 0·9—1·4 cm. longa, pellucida, sine colore vel pallide brunnea vel rosea, nervis fuscis 3; *bracteolae* quam bractea aequilongae, bicarinatae, breviter bicuspidatae. *Flores* sat grandes, gilvi vel pallide rosei vel lilacini vel violaceo-caerulei, plerumque odorati; *peranthii tubus* e bractea bene exsertus, circa 1·5 cm. longus, parte dimidia inferiore cylindrica, superne gradatim ampliatus in faucibus 4—6 mm. diam.; *segmenta* oblonga obtusa, 1·5—1·8 cm. longa, 7—9 mm. lata. *Stamina* in perianthii tubo medium versus orta, filamentis decurrentibus, ad 1·3 cm. longis persaepe leviter vel bene exsertis, raro plus minusve inclusis; antherae lineares, 5—6 mm. longae. *Ovarium* rotundum, 2·5—3 mm. longum; stylus prope ad apicem filamentorum vel ad medium antherarum attingens, ramis linearibus conduplicatis 4—5 mm. longis, parte dimidia vel tertia superiore leviter ampliata et minute ciliata.

Corm oviod or subglobose, 1—1·8 cm. diam.; tunics of dark fairly hard reticulate fibres usually extending up in a neck 1—2·5 cm. long. *Stem* filiform, 22—38 cm. high, simple or with 1—2 very short branchlets less than 1 cm. long. *Basal sheaths* 2, membranous, brownish, up to 12 cm. long. *Leaves* 3, the 2 lower linear or linear-filiform, about half as long as the stem, 0·5—1 mm. wide, firm with the mid-rib and margins slightly prominent; upper leaf much longer, entirely sheathing. *Spike* laxly 1—2-flowered (occasionally 3), the branchlets when present 1-flowered. *Bract* oblong, shortly tricuspidate, 0·9—1·4 cm. long, pellucid, colourless, pale brown or pinkish, with 3 dark veins; *bracteoles* as long as bract, bicarinate, shortly bicuspidate. *Flowers* fairly large, cream-coloured, pale pink, pale mauve or violet blue, usually fragrant; *perianth tube* about 1·5 cm. long, well exserted from bract, the lower half cylindrical and upper gradually expanded to 4—6 mm. diam. at the throat; *lobes* oblong, obtuse, 1·5—1·8 cm. long, 7—9 mm. wide. *Stamens* arising near middle of perianth tube, the filaments decurrent, up to 1·3 cm. long, slightly to well exserted or occasionally more or less included; anthers linear, 5—6 mm. long. *Ovary* rotund, 2·5—3 mm. long; style reaching nearly to top of filaments or to middle of anthers, the branches linear, conduplicate, 4—5 mm. long, usually with the upper third or half slightly expanded and minutely ciliate.

Holotype. *Barker* 8635 in the Compton Herbarium, Kirstenbosch.

Sandy flats and mountain slopes from the Clanwilliam Division to the Cold Bokkeveld in the Ceres Division.

Flowering period. August—September.

CLANWILLIAM. Cedarberg, *Lamb*, NBG 1621/30 (BOL); *Barnes* (BOL 19322); *Esterhuysen* 8074 (BOL); *Lewis* (BOL 22250); *Hafstrom* and *Acocks* 307 (S); *Stokoe* (SAM 55669); S. Cedarberg, *Esterhuysen* 20570 (BOL); Welbedacht Kloof, *Stokoe* (SAM 55667); Kromrivier, *Stokoe* (SAM 60110); Matjesrivier, *Wagener* 140 (NBG).

PIKETBERG. *Marloth* 10563 (PRE).

CERES. Elands Kloof, *Stokoe* (SAM 55665); *Lewis* 1398 (SAM); *Barker* 3781, 8428, 8600 (NBG); *Compton* 17347 (NBG); between Citrusdal and Cold Bokkeveld, *Leighton* 1261 (BOL, PRE); Cold Bokkeveld, near Elands Kloof, *Leighton* 1276 (BOL); same, Waboomsrivier, *Lewis* 1399, 4438, 5009 (SAM); north of Waboomsrivier, *Barker* 8635 (NBG); between Waboomsrivier and Ysterfontein, *Lewis* 2641 (SAM); Cold Bokkeveld, about 24 miles from Prince Alfreds Hamlet, *Story* 3004 (PRE).

A very slender narrow-leafed species closely allied to *I. capillaris* but with considerably larger flowers. It is somewhat intermediate between *I. capillaris* and *I. latifolia*, with the slender stem and narrow leaves of the former and a few uniformly large flowers resembling those of *I. latifolia*. The stamens are almost always long and well exserted from the perianth tube but they are occasionally short and more or less included.

In the Kew Index, Supplement 9, *I. paucifolia* Lewis was recorded as *I. pauciflora* in error. As far as is known the epithet *pauciflora* has not previously been used in the genus.

8. **I. cochlearis** Lewis, Fl. Pl. Afr. t. 969. 1946.

Corm obliquely ovoid or subglobose, 1·2—2·2 cm. diam.; tunics of very fine more or less reticulate fibres nearly always extending up in a neck 2—4 cm. long. *Stem* arising obliquely from the corm, simple, 15—45 cm. long (average 20—30 cm.), usually flexuose, sometimes curved near the middle and the upper half subdeclinate. *Leaves* 3 basal and 2 or 3 cauline, linear, erect or suberect, 10—30 cm. long, 1—3 mm. wide, usually reaching to base of spike or shortly below it. *Spike* 3—8 cm. long, somewhat laxly 4—12-flowered, the rachis usually flexuose. *Bract* obovate or oblong, 4—5 mm. long (rarely up to 6 mm.), tridentate, pale brown, pinkish or pallid with a few brown streaks, usually with 3 major and a few minor inconspicuous veins; *bracteoles* slightly shorter, bicarinate, bidentate. *Flowers* rose-pink or salmon-pink with darker median veins on the lobes; *perianth tube* 1—1·8 cm. long, the lower half slender and upper narrowly infundibuliform, gradually dilated to about 3 mm. diam. at the throat; *lobes* equal, oblong, obtuse, concave with the apex slightly involute, 1—1·7 cm. long, 6—8 mm. wide. *Stamens* arising near top of perianth tube, the filaments shortly decurrent, well exserted, 0·7—1 cm. long; anthers 4—5 mm. long. *Ovary* rotund, 2·5—4 mm. long; style reaching to top of anthers, the branches 1·5—2 mm. long, spathulate, conduplicate, minutely ciliate.

HOLOTYPE. *Wicht* in the National Herbarium, Pretoria (No. 27196).

Dry stony mountain slopes in the Stellenbosch Division.

Flowering period. November.

STELLENBOSCH. Jonkershoek, *Wicht* (PRE 27196, BOL, SAM); *Borchardt*, Jonkershoek Forest Reserve Station 584, 586 (BOL); *Parker* (K); *Levyns* (CT 7505); *Rehm* (M): Banhoek, *Martley* (SAM 53175, BOL)

A distinct species somewhat intermediate between the sections *Ixia* and *Morphixia* but placed in the latter on account of its narrowly funnel-shaped perianth tube, with the filaments arising shortly below the top and shortly decurrent (in the illustration of the type in Flowering Plants of Africa this is not very clearly shown). It is not very closely allied to any species in the section. The flowers resemble those of some forms of *I. latifolia* but the corm, leaves, simple flexuose stem and much shorter bracts are quite different.

9. **I. framesii** L. Bolus, S. Afr. Gard. 21: 368. 1931. *I. pulcherrima* Eckl. Top. Verz. 24. 1827, *nom. nud.*, pro parte.

Corm globose, 1·2—1·8 cm. diam.; tunics of fine soft reticulate fibres, often submembranous. *Stem* simple, very slender, 15—38 cm. high. *Basal sheaths* 2—3, 1—7·5 cm. long. *Leaves* 3 or 4, linear, erect, usually reaching to base of spike or shortly above it, 12—40 cm. long, 1—2 mm. wide, not conspicuously veined, the cauline leaf sometimes only shortly sheathing with a long free blade. *Spike* short, closely 2—12-flowered, usually 3—6. *Bract* obovate or oblong, 6—8 mm. long, acute or shortly tridentate, pallid below with the upper half soft, brown and more or less papyraceous, the apex soon becoming lacerated; *bracteoles* slightly shorter, closely bicarinate, bicuspidate or bidentate. *Flowers* flaccid, salmon-pink or pinkish terra-cotta with a darker circle at the centre and the tube purplish outside, or reddish yellow to yellow above with a very small dark ring at the centre and the outer lobes usually red outside; *perianth tube* 1·5—2 cm. long, filiform near the base, gradually expanded upwards and narrowly infundibuliform, 3—5 mm. diam. at the throat; *lobes* oblong, ovate or obovate-oblong, obtuse, equal or the inner slightly larger than the outer, 1·5—2·4 cm. long, 0·8—1·2 cm. wide. *Stamens* arising within the tube, the filaments shortly decurrent, 4—5 mm. long, included or extending 1—2 mm. above the throat; anthers yellow, 4—6 mm. long, partly or entirely exserted. *Ovary* globose, about 3 mm. long; style reaching to base or middle of anthers, the branches 2—3 mm. long, linear, conduplicate, with the upper half minutely ciliate.

HOLOTYPE. *Frames* in the Bolus Herbarium (No. 19896).

Sandy flats in the Malmesbury Division.

Flowering period. September—October.

MALMESBURY. Near Darling, *Frames* (BOL 19896, K); between Darling and Malmesbury, *Salter* 2711 (K, SAM); Darling, *Strey* 271 (M); Darling Flower Show, *Maguire* 445 (NBG); Groenekloof, *Ecklon* 81 (66·9) (G, SAM—named *I. pulcherrima*); near Klipfontein, Swartland, *Pappe* (SAM 25226); near Green River, 26—27 miles N. of Cape Town on national road, *Lewis* 5749 (NBG); Kalabas Kraal, *Werdermann* and *Oberdieck* 293 (B, PRE).

WITHOUT LOCALITY. *Ecklon* (L); *Thunberg* (UPS, *I. maculata* sheet b).

The delicate nature of the flowers renders this distinct and very beautiful species unsuitable for cultivation. The flowers tend to close as soon as they are picked and do not fully open in water.

Some of the plants distributed by Ecklon as *I. pulcherrima* are this species and others *I. campanulata*, but Ecklon's name must in any case be rejected as a *nomen nudum* since he gave no description of the plant, only a note on the colour of the flowers "Blumenblatter hochroth glanzend", which applies to *I. campanulata* rather than *I. framesii.*

Dr. L. Bolus placed *I. framesii* in the section *Ixia* on account of the dark circle of colour at the centre of the flower but it has been found that no great importance can be attached to this character as flowers with or without a contrasting patch of colour in the middle may occur in the same species (e.g. *I. polystachya*), also that flowers with contrasting colours on the lobes do occur in the section *Morphixia*, as in *I. leipoldtii.* It is on account of its funnel-shaped tube, in which the stamens are more or less included, that *I. framesii* is now placed in the section *Morphixia.*

10. **I. odorata** Ker (Fig. 2), Gen. Irid. 101. 1827; Baker, Handbk. Irid. 165. 1892 et Fl. Cap. 6: 84. 1896; Dur. & Schinz, Consp. Fl. Afr. 5: 185. 1895; Pole Evans, Fl. Pl. S. Afr. 9. t. 349. 1929. *Morphixia odorata* (Ker) Baker, Journ. Linn. Soc. Bot. 16: 97. 1877. *Ixia erecta* var. Jacq. Hort. Schoenbr. t. 18. fig. min. 1797. *I. erecta* var. *lutea; odorata* Ker, Bot. Mag. t. 1173. 1809. *I. polystachya* var. *flexuosa* Lam. Encyc. 3: 339. 1789. *I. flavescens* Eckl. Top. Verz. 26. 1827. *I. polystachya* var. *flavescens* (Eckl.) Baker, Journ. Linn. Soc. 16: 90 et Fl. Cap. 6: 78; Dur. & Schinz l. c. 185. ? *I. erecta* sensu Thunb. Diss. Ix. 16. 1783. ? *I. avellana* Foster, Contrib. Gray Herb. 114: 47. 1936.

Corm ovoid or globose, 0·9—1·4 cm. diam.; tunics of fine or moderately fine reticulate fibres. *Stem* 20—55 cm. high, usually 35—45 cm., simple or with 1 or occasionally 2 short suberect branches. *Leaves* 3—6, linear or lanceolate, suberect to erect or the outer sometimes patent, often spirally twisted above the middle, 8—30 cm. long, usually reaching to about middle of stem and 12—18 cm. long, 1·5 mm. to 1 cm. wide, the margins and mid-rib sometimes slightly prominent. *Spike* short, compact, 2·5—6·5 cm. long, closely 5—18-flowered. *Bract* 5—7 mm. long, shortly cuspidate or with a cusp and 2 short teeth or tricuspidate, somewhat colourless or slightly pinkish with 1, 3 or several inconspicuous veins; *bracteoles* bicuspidate or sometimes bifid nearly to the middle. *Flowers* small, sulphur or lemon-yellow, the outer lobes occasionally flushed with red outside; *perianth tube* 0·7—1·1 cm. long, the lower half filiform and upper narrowly infundibuliform, usually 2—3 mm. diam. at the throat; *lobes* oblong, about as long as the tube, rarely up to 5 mm. longer, 4·5—5·5 mm. wide, equal or the outer a little wider than inner, concave with the apex usually more or less involute. *Stamens* arising near the throat, the filaments shortly decurrent, 4—5 mm. long, exserted from the tube;

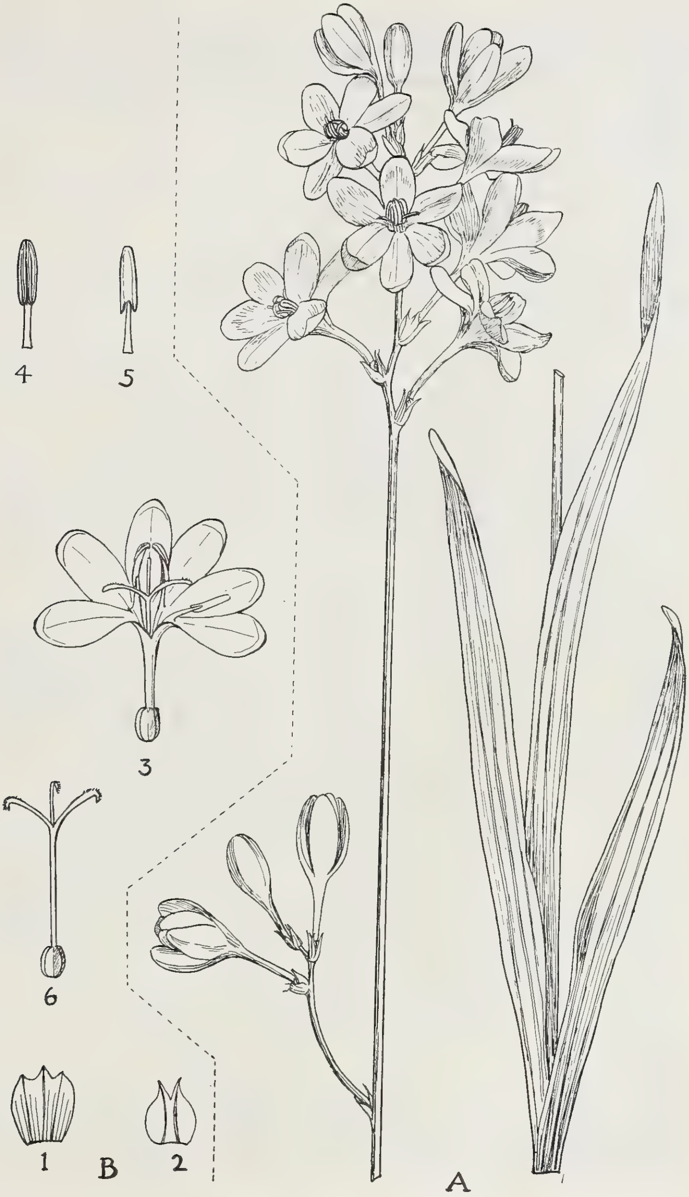


FIG. 2.—*I. odorata.* A. Copied from Bot. Mag. t. 1173 (*I. erecta* var. *lutea*; *odorata* Ker). B. *Lewis* No. 5541. 1. Bract × 2. 2. Bracteoles × 2. 3. Flower laid open × 1½. 4. Stamen, front view, × 2. 5. Stamen, back view, × 2. 6. Gynaecium × 1½. Del. G. J. Lewis.

anthers linear, 4—5 mm. long. *Ovary* oblong or ovoid, about 3 mm. long; style reaching to top of perianth tube or up to 1 mm. above, the branches 4·5—7 mm. long, linear, conduplicate, appearing filiform, sometimes very slightly expanded towards the apex, usually about half as long as the style.

LECTOTYPE. Botanical Magazine t. 1173.

Fairly common on sandy flats and lower slopes of mountains in the south-western districts of the Cape Province.

Flowering period. September—November.

CLANWILLIAM. Olifants River and Villa Brakfontein, *Ecklon* and *Zeyher* 76·10 (PRE).

PIKETBERG. *Guthrie* (BOL); Kapiteins Kloof, Piketberg Mt., *Pillans* 7801 (BOL, K); Porterville, *Loubser* 412 (BOL); mountain above Porterville, *Loubser* 857 (NBG); Cardouw Pass, *Compton* 23019 (BOL, NBG); Twenty-four Rivers, *Leipoldt* 3816 (NBG).

TULBAGH. Tulbaghskloof, *Ecklon* 87 (77·9) (*I. flavescens* Eckl.; B, BR, G, PRE, SAM, S, UPS, Z); *Ecklon* 435 (PRE, Z).

WORCESTER. *Zeyher* (K); between Worcester and Villiersdorp, *Lewis* 2902 (SAM); between Slangheuvel, French Hoek and Donkerhoek, *Drege* 8353 (G).

HOPEFIELD. Near Hopefield, *Bachmann* 1219 (Z).

MALMESBURY. Between Mamre and Darling, *Lewis* 1028 (SAM); road to Malmesbury, *Dame Alice* and *Misses Godman* 442 (BM); Darling, *Letty* 127 (K, PRE); Mamre, *Lewis* 5541 (NBG); *van Niekerk* 269 (NBG); *Compton* 15859 (NBG); Groenekloof, *Pappe* (SAM 25231); Kalabas Kraal, *Strey* 277 (M); near Riebeeck Kasteel, *Leipoldt* 3818 (BOL).

BELLVILLE. Durbanville, *Compton* 16019 (NBG).

CAPE. Near Hout Bay, *Salter* 8686 (BOL); *Lewis* 947 (SAM); near Camps Bay, *Pappe* (K); Table Mt., *Rehmann* 605 (BM, BR, Z); Devils Peak, *Dod* 383 (BM, BOL, K); *Bolus* 4005 (BOL); between Wynberg and Kirstenbosch, *Zeyher* 4668 (BM, BOL, K, SAM); Constantia Nek, *Salter* 332/15 (BM); *Barker* 3188 (NBG); *Pillans* 10506 (BR); Orange Kloof, *Dod* 3480 (BM, BOL, K); Wynberg plateau, *Esterhyusen* (BOL 26894).

PAARL. French Hoek, 1,500 ft., *Phillips* 1312 (SAM); French Hoek Pass, 2,000 ft., *Barker* 4901 (NBG).

STELLENBOSCH. Hottentots Holland Mts., 3,000 ft., *Esterhuysen* 9957 (BOL).

CALEDON. Near Mossel River, *Purcell* (SAM 46272); *Martin* 563 (NBG); near Hermanus, *Barker* 1792 (NBG); *Rogers* 26505 (PRE, Z); *van Niekerk* 660 (BOL); *Marloth* 7117 (PRE); *Gillett* 4367 (BOL); Rooi Els, *Leipoldt* 4157 (BOL); Hottentots Holland Mts., *Stokoe* 8093 (BOL).

WITHOUT LOCALITY. *Drege* (G); *Sieber* 130 (G, K, L, M); *Harvey* 872 (BM); *Jussieu* 3594, partly (P); *Ecklon* 437 (K, M, PRE); *Lamarck* (P; *I. polystachya* var.); *Oldenland* (M); *Sparrman* (S); *Thunberg* (S, UPS).

As far as is known the flowers always remain closed in the morning and open in the early afternoon. In the dried state it is sometimes difficult to distinguish this species from the yellow variety of *I. polystachya*, or small-flowered forms of *I. dubia*, especially when the perianth tube is very slightly expanded and only narrowly funnel-shape, but living plants can readily be distinguished by the way in which the lobes spread, not from the top of the tube as in the section *Ixia*, but from shortly above the base of the lobes with the lower part more or less erect and overlapping to form a wide funnel-like extension of the tube. This is clearly shown in the excellent illustration in the Botanical Magazine, t. 1173.

In his account of the South African Iridaceae of Thunberg's Herbarium, N. E. Brown made the following statement about the sheets named *I. erecta*:— "Three sheets, all *I. erecta* Thunb. but not *I. erecta* Berg. Cap. 5 (1767) which is a synonym of *I. polystachya* L. Thunberg's plant is the same as *Sieber* 130 and *Ecklon* 442 (issued as *I. monadelpha*). It has broad leaves (3—7 lines broad), with the flowers very closely placed on the spike, and is quite distinct from *I. erecta* Berg., which has narrower leaves and the flowers lax and rather distant on the spike." (Trans. Linn. Soc. Bot. 48: 46. 1928). It is twelve years since I examined Thunberg's specimens and as I did not make detailed notes on those named *I. erecta* at the time my recollection of them is somewhat uncertain. However, I have recently examined *Sieber* 130 and *Ecklon* 442 in Kew Herbarium (kindly sent here on loan), and found that the former, which N. E. Brown considered to be an exact match with Thunberg's plants, is *I. odorata*. I have accordingly cited *I. erecta* sensu Thunb. in the synonymy, though with a query as there remains some doubt about it.

The second collection which Dr. Brown considered to be the same as *I. erecta* Thunb., *Ecklon* 442, does not match *Sieber* 130 but is the blue or mauve-flowered variety of *I. polystachya* I have named var. *crassifolia*. A third species is also involved as Dr. Brown noted on a sheet in Kew Herbarium containing two specimens of *I. dubia*, collected by Dr. Thom, that he had compared this with Thunberg's sheets of *I. erecta* and found that they matched except that the leaves are broader in Thunberg's plants. Thunberg described the flowers as "Variat corollis luteis et violaceis unicoloribus", and in view of this and the above identifications by N. E. Brown, the identity of Thunberg's *I. erecta* remains uncertain and cannot be decided without making a critical examination of his plants. There seems to be a possibility that more than one species was named *I. erecta* by him.

In 1936 Foster drew attention to Dr. Brown's report on Thunberg's sheets named *I. erecta* and since Thunberg's plants appeared to him to be without a name (*I. erecta* Thunb. being a later homonym of *I. erecta* Berg.=*I. polystachya* L.) he named the species *I. avellana*. This name is also cited above with a query as a synonym of *I. odorata*.

Var. **hesperanthoides** Lewis var. nov.

Var. *odoratae* similis sed floribus minoribus, albis vel gilvis interdum segmentis exterioribus extrinsecus rubidis.

Perianthii tubus 5—8 mm. longus, segmentis aequans. *Filamenta* 2—3 mm. longa; antherae 4—5 mm. longae.

Like var. *odorata* but the flowers slightly smaller, white or cream-coloured with the outer lobes sometimes reddish outside.

Perianth tube 5—8 mm. long, as long as the lobes. *Filaments* 2—3 mm. long; anthers 4—5 mm. long.

HOLOTYPE. *Pillans* 7184 in the Bolus Herbarium.

Mountain slopes in the Piketberg, Tulbagh and Worcester Divisions.

Flowering period. October—December.

PIKETBERG. Top of range S. of Zebrakop, *Pillans* 7184 (BOL, PRE, SAM); Piketberg Mt., *Barker* 7561 (NBG).

TULBAGH. Near Tulbagh, *Ecklon* 438 (K, M, PRE).

WORCESTER. Du Toits Kloof, *Drege* 8370 (K, S); Hex River Valley, *Tyson* 715 (BOL, SAM).

WITHOUT LOCALITY. *Ecklon* and *Zeyher* 237 (1. 12) (G); *Thunberg* (UPS).

This variety closely resembles *I. orientalis* but has short filaments and a short style with comparatively long branches arising at the throat of the tube; the flowers, too, are usually smaller. The funnel-shaped tube distinguishes it from *I. polystachya* with which it has sometimes been confused. The small sweet-scented flowers with fairly long slender style branches arising at the throat of the tube are similar to those of some species of *Hesperantha*, and according to a note by Mr. Pillans the flowers open late in the afternoon as in that genus.

It is possible that the name *I. alba* Eckl. (Top. Verz. 27. 1827), a *nomen nudum* and also a later homonym of *I. alba* L. (=*Sparaxis* sp.), was meant for this plant but as Ecklon and Zeyher applied it to two different species there is some doubt about it. In the Delessert Herbarium in Geneva plants of *I. odorata* var. *hesperanthoides*, *Ecklon* and *Zeyher* 267, are named *I. alba*, while in other herbaria there are some collections of *I. orientalis* issued as *I. alba* (e.g. *Zeyher* 4007).

11. **I. stohriae** L. Bolus, S. Afr. Gard. 21: 281—2. 1931. *Tritonixia conferta* Klatt, Abh. Naturf. Ges. Halle 12: 356 et Erganz. 22. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 209. 1895.

Corm ovoid, 0·5—1 cm. diam.; tunics of very fine soft reticulate fibres. *Stem* 15—35 cm. high (occasionally up to 50 cm.), slender, simple or with 1—2 more or less patent curved branches. *Basal sheaths* 2, 2—10 cm. long. *Leaves* 4—6, 2—3 basal and 2—3 cauline, erect, flaccid, linear or linear-lanceolate, 10—45 cm. long, 2—4 mm. wide. *Spike* 1·5—5·5 cm. long, fairly closely 3—12-flowered. *Bract* ovate, tricuspidate or tridentate, 5—6 mm. long, usually mauve-pink with 3 or 5 dark veins; *bracteoles* bicarinate, bicuspidate or bidentate. *Flowers* pale pink or white flushed with pink outside; *perianth tube* 1—1·6 cm. long, slightly and gradually expanded from base to throat or the lower half cylindrical and upper narrowly infundibuliform, occasionally more or less tubular, 2·5—3 mm. diam. at the throat; *lobes* slightly shorter than tube, oblong, 0·9—1·4 cm. long, 3·5—6 mm. wide, the outer very slightly larger than inner. *Stamens* arising a little below the throat, the filaments shortly decurrent, 2—3 mm. long, included or with the tips exserted; anthers oblong or linear-oblong, 2—3 mm. long. *Style* reaching nearly to top of filaments or middle of anthers, the branches subspathulate, conduplicate, recurved, 1·5—2·5 mm. long.

LECTOTYPE. *Smith* in the Bolus Herbarium (No. 19879).

Mountain slopes and kloofs in the Swellendam Division.

Flowering period. September—October.

SWELLENDAM. *Stohr*, NBG 1174/24 (BOL); Voormansbosch, *Zeyher* 4014 (SAM, K, PRE, Z); 10 o'clock Mt., 800 ft., *Wurts* 357 (NBG); Tradouw Pass, *Smith* (BOL 19879); *Esterhuysen* 24614 (BOL); *Sidey* 1793 (PRE); same, 2,000 ft., *Wurts* 1676 (NBG).

I. stohriae is distinguished from the closely allied *I. fucata* by its perianth tube which is nearly always slightly expanded to the throat and more or less narrowly funnel-shaped, its shorter filaments included in the tube or with the tips exserted, and shorter anthers, only 2—3 mm. long as against 4—5 mm. in *I. fucata.*

Two collections were cited under the original description, the first, collected by Mrs. Stohr in whose honour the species was named, is a single incomplete plant, but there are five complete plants in the second, collected by Smith, and since the description must have been largely based on them, the second has been selected as the lectotype. These collections have been compared with isotypes of *Tritonixia conferta* Klatt, *Zeyher* 4014, and found to be the same, but as Foster gave the name *Ixia conferta* to a different species in 1936, the specific epithet cannot now be used for this one.

In the Flora Capensis Baker placed *Tritonixia conferta* Klatt as a synonym of *Tritonia dubia* Eckl. (vol. 6, p. 125), and cited *Zeyher* 4014, but earlier in the same work (p. 79) he cited *Zeyher* 4014 under *I. aristata* var. *elegans*. According to N. E. Brown, *Zeyher* 4014 is *I. polystachya*, "the true plant, and distinct from several of the specimens so named by Baker" (Journ. Linn. Soc. Bot. 48: 43, 1928). I have dissected a flower from a plant of *Zeyher* 4014 in the South African Museum Herbarium (which matches material in Kew Herbarium) and found it to be the same as *I. stohriae*, with short filaments included in the narrow funnel-shaped tube. In the Zurich University Herbarium, however, there are two species under *Zeyher's* No. 4014, one being *I. stohriae* and the other *I. orientalis* which somewhat resembles the former but has a comparatively shorter perianth tube and much longer stamens well exserted from the tube. As it is very unlikely that Klatt would have placed specimens of *I. orientalis* in his genus *Tritonixia*, it is fairly safe to assume that his type of *T. conferta* (which was destroyed during the last war) must have been the same as the isotypes in Kew and the South African Museum Herbarium.

12. **I. fucata** Ker, Bot. Mag. t. 1379. 1811; Dur. & Schinz, Consp. Fl. Afr. 5: 183. 1895.

Corm ovoid or subglobose, 1·5—2 cm. diam.; tunics of fine reticulate fibres usually extending up in a neck 3—6 cm. long. *Stem* 15—60 cm. high, usually 15—30 cm., slender, simple or with 1 very short suberect branch. *Leaves* 3—4, linear or subulate, usually 2 basal and 2 cauline, 13—48 cm. long, 1·5—3 mm. wide, the mid-rib and often the margins fairly prominent, sometimes faintly striate with 4 or 5 slightly raised veins. *Spike* very short, 2—7-flowered, the rachis usually flexuose, sometimes curved and more or less declinate. *Bract* ovate or ovate-oblong, tridentate, 5—8 mm. long, pellucid, pinkish mauve, conspicuously 3 or 5-veined, sometimes minutely speckled with brown near the apex; *bracteoles* slightly longer than bract, bicarinate, bicuspidate. *Flowers* hypocrateriform, white or pale pink, the perianth tube and outer lobes suffused with deep pink or maroon outside and usually small streaks of the same colour at the base of all the lobes inside; *perianth tube* 1—1·5 cm. long, tubular throughout and about 2 mm. in diam. or sometimes slightly expanded from the base to the middle and tubular above, 1·5—2 mm. diam. at the throat; *lobes* as long as the tube or slightly shorter, oblong or obovate, obtuse, 0·9—1·4 cm. long, 5—8 mm. wide, equal or the outer slightly wider than inner. *Stamens* arising shortly below the throat, the filaments decurrent on the tube, exserted, 3—5 mm. long; anthers 4—5 mm. long, linear, subsagittate. *Style* reaching to middle or top of anthers, the branches 2—3 mm. long, oblanceolate, conduplicate, recurved.

LECTOTYPE. Botanical Magazine t. 1379.

Mountain slopes and kloofs in the Ceres, Worcester, Montagu and Robertson Divisions at altitudes of 3,000 to 6,000 ft.

Flowering period. September—November.

CERES. Ceres Wild Flower Show, *Barker* (BOL).

WORCESTER. Keeromsberg, 4,500 ft., *Esterhuysen* 9248 (BOL); Hex River Mts., Milner Ridge Peak, 5,000—6,000 ft., *Esterhuysen* 9326 (BOL); Hex River Mts., Mt. Brodie, 5,000—5,500 ft., *Esterhuysen* 22229 a (BOL).

ROBERTSON. Near stream in kloof, *Levyns* (CT 4374).

MONTAGU. Donker Kloof, 3,000 ft., *Compton* 18477 (NBG, SAM).

Var. **filifolia** Lewis var. nov.

A var. *fucata* caule longiore graciliore et foliis longioribus angustissimis differt.

Cormus ovoideus, 1—1·5 cm. diam., tunicis non in collo productis. *Caulis* filiformis, 30—60 cm. longus. *Vaginae basales* 2, 3—9 cm. longae. *Folia* 3, lineari-filiformia, 30—60 cm. longa, 0·5—1 mm. lata. *Spica, bractea* et *flores* var. *fucatae* similes.

Differs from var. *fucata* in having a longer and more slender stem and longer very narrow leaves.

Corm ovoid, 1—1·5 cm. diam.; tunics not produced up in a neck. *Stem* filiform, 30—60 cm. high. *Basal sheaths* 2, 3—9 cm. long. *Leaves* 3, linear-filiform, 30—60 cm. long, 0·5—1 mm. wide. *Spike, bract* and *flowers* as in var. *fucata*.

HOLOTYPE. *Stokoe* in South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Mountain slopes up to 3,500 ft., alt. in the Paarl, Worcester and Caledon Divisions.

Flowering period. September—October.

WORCESTER. Boschjesveld Mts., Worcester side, *Stokoe* (SAM 68608, 68609).

PAARL. French Hoek Forest Reserve, *Lewis* (BOL 26938).

CALEDON. Wolven Kop, Wildepaardeberg, 3,500 ft., *Stokoe* 2507 (BOL).

This species is distinguished by its tubular perianth tube, about 2 mm. in diameter, which does not expand to the throat. During the past thirty years it has been collected in the various localities cited above but for over a hundred years it was known only from the Botanical Magazine figure, published in 1811, from a drawing made several years earlier. Ker expressed some doubt about it being a genuine species and suggested that it might be a garden hybrid, possibly a cross between *I. crateroides* (=*I. campanulata*) and *I. capillaris*. The same view was held by

Baker, who mentioned *I. fucata* in a note under *I. scariosa* (=*I. latifolia*) in the Flora Capensis (Vol. 6, p. 83), and suggested that the latter might be one of the parents. In the Genera Plantarum, Bentham and Hooker suggested that *I. fucata* would be better placed in the genus *Hesperantha* (Vol. 3, p. 704). However, since ample material which matches the type figure is now available, there is no longer any doubt that it is a genuine and very distinct species of *Ixia*. It seems to belong in the section *Morphixia* rather than the other two, and is closely allied to *I. stohriae*, in which the perianth tube is usually slightly expanded to the throat, with the stamens not or only shortly exserted.

In the form from the Montagu and Robertson Divisions the stamens are all directed to one side and unilateral.

13. **I. orientalis** L. Bolus, S. Afr. Gard. 19: 27. 1929. *I. scariosa* var. *longifolia* Baker, Handbk. Irid. 165. 1892 et Fl. Cap. 6: 83. 1896, pro parte.

Corm ovoid or subglobose, 0·6—1·4 cm. diam.; tunics of fine reticulate fibres. *Stem* slender, often filiform, 25—75 cm. high, simple or with 1—3 erect filiform branches. *Basal sheaths* 2 or 3, acuminate, 2—12 cm. long. *Leaves* 4—5, linear or linear-lanceolate, 7—60 cm. long, 1·5—6 mm. wide, occasionally to 8 mm., suberect or erect, usually slightly twisted, the mid-rib fairly prominent. *Spike* laxly or fairly laxly 2—16-flowered, the rachis usually somewhat flexuose with the bracteoles closely adpressed to the curves. *Bract* oblong or ovate, 5—8 mm. long, subtruncate with a very short cusp, sometimes with a cusp and 2 short teeth or shortly tridentate, pellucid, colourless or pinkish to pinkish mauve, rather faintly 3 or several-veined; *bracteoles* bicarinate, bicuspidate. *Flowers* cream-coloured, very pale pink or mauve-pink, the outer lobes usually mauve outside; *perianth tube* 0·7—1 cm. long, occasionally to 1·2 cm., the lower half cylindrical and upper narrowly infundibuliform, 2—3 mm. diam. at the throat; *lobes* oblong, obtuse, 1—1·8 cm. long, 5—9 mm. wide, equal or the outer slightly shorter and wider than inner. *Stamens* arising near top of perianth tube with the filaments shortly decurrent, 3·5—6 mm. long, well exserted; anthers 4—5 mm. long, linear-oblong, up to 2 mm. wide. *Ovary* oblong or rotund, about 3 mm. long; style reaching above middle of filaments, sometimes nearly to top of anthers, the branches linear, conduplicate, 3—5 mm. long, slightly expanded and minutely ciliate towards the apex.

HOLOTYPE. *Dyer* 1684 in the Bolus Herbarium. PRE iso

Sandy flats, hills and mountain slopes in the southern and south-eastern districts of the Cape Province.

Flowering period. September—October, occasionally also from November to January.

CALEDON. *Prior* (K); Villiersdorp, *Esterhuysen* (BOL 26874); River Sonderend, *Martin* 788 (NBG); *Stokoe* (SAM 63501): Genadendal, *Prior* 148, 163 (K).

BREDASDORP. Bontebok Park, *Martin* 583 (NBG); Die Mond, *Heginbotham* 167 (NBG).

SWELLENDAM. *Martin* 368 (NBG); *Zeyher* 452 (SAM), 4007 (K, PRE, SAM, S, Z); Hermitage Kloof, *Wurts* 381 (NBG); Marloth Reserve, *Wurts* 376 (NBG); Voormansbosch, *Zeyher* 4014, partly (Z).

RIVERSDALE. Soetmelks Rivier, *Burchell* 6708 (K); between Riversdale and Albertinia, *Barker* 84 (K); near Albertinia, *Lewis* 3642 (SAM); *Barker* 8169 (NBG); *Cassidy* 242, 245 (NBG); hills near Kafirkuils River, *Muir* 2983 (PRE); road to Gouritz River mouth, *Lewis* 5594 (NBG); Garcias Pass, north end, *Lewis* 5650 (NBG); near Riversdale, *Schlechter* 2024 (Z).

MOSSEL BAY. *Muir* (BOL 21935); Ruytersbosch, *van Niekerk* 85 (BOL, PRE).

LADISMITH. Rooiberg, *Wurts* 1648 (NBG).

GEORGE. Great Brak, *Burchell* 6156 (K); *Lewis* 5606 (NBG); 4 miles E. of Great Brak, *Lewis* 5579 (NBG); near George, *Burchell* 6092 (K); Montagu Pass, *Rehmann* 50 (BM, BR, Z); slopes above Victoria Bay, *Lewis* 3641 (SAM); *Barker* 8171 (NBG); Groen Vlei, *Martin* 369 (NBG); Ruigte Vlei, Swart Rivier, *Fourcade* 1530 (BOL, K, PRE).

OUDTSHOORN. Near top of Swartberg Pass, 5,000 ft., *Stokoe* (SAM 63502, 68327); Meirings Poort, *Stokoe* (SAM 60176).

KNYSNA. Portland, *Duthie* 521 (BOL); Belvidere, *Duthie* 1140 (BOL); between Knysna River Bridge and Ashford, *Duthie* 1143 (BOL); Noetzie, *Middlemost* (NBG, SAM); Keurbooms River, *Theron* 2098 (PRE); Plettenberg Bay, *Smart* (PRE); *Rogers* 26705, 27965 (Z); Groot Rivier, *Taylor* 3609 (NBG).

UNIONDALE. Near Avontuur, *Bolus* 2487 (BOL, K); *Gillett* 1587 (BOL); Kouga Mts., near Smutsberg, *Esterhuysen* 10773 (BOL); Hoopsberg, *Esterhuysen* 6575 (BOL).

HUMANSDORP. Ratelsbosch, Tsitsikamma, *Fourcade* 501 (BOL); Kruisfontein, near Humansdorp, *Galpin* 4685 (K, PRE); Humansdorp, *Thode* A 1039 (K, PRE); Jeffreys Bay, *Fourcade* 4008 (K).

UITENHAGE. Despatch, *Holland*, NBG 1383/25 (BOL); Addo, *Ecklon* and *Zeyher* 77 (SAM), 697 (S).

PORT ELIZABETH. *Long* 811 (K, PRE); Walmer, near Port Elizabeth, *Paterson* 772 (BOL); near Port Elizabeth, *Blackbeard* (BOL); Baakens Valley, Port Elizabeth, *Cruden* 394 (PRE); Green Bushes, about 10 miles N.W. of Port Elizabeth, *Holland* 3642 (BOL); Longmore Forest Reserve, *Long* 1050 (K, PRE).

ALBANY. Between Sevenfountains and Sidbury, *R.A. Dyer* 1684 (BOL, K, PRE); near Southwell, Lower Albany, *Schonland* 781 (Z).

BATHURST. Port Alfred, *Rogers* 4413 (BOL).

WITHOUT LOCALITY. *Cooper* 460 (K—locality given is Elands Bay).

This species is widely distributed through the southern and south-eastern districts of the Cape Province and extends as far as the Bathurst Division, the easternmost locality on record for the genus. In the dried state it closely resembles *I. flexuosa* in the section *Ixia*, but is distinguished by its slightly longer perianth tube, about as long as the lobes or slightly longer, with the upper half gradually expanded to the throat and narrowly funnel-shaped, the stamens arising near the top and shortly decurrent.

Baker's var. *longifolia* of *I. scariosa* (Handbk. Irid. 165 and Fl. Cap. 6: 83) was based on two collections which represent two distinct species, one of which is *I. orientalis* (*Bolus* 2487). The other, *Bolus* 2621, is a variety of *I. rapunculoides*.

SECTION **IXIA**

Section *Eurydice* Pers. Syn. 1: 48. 1805. Subgenus *Eurydice* (Pers.) Baker, Journ. Linn. Soc. Bot. 16: 92. 1877, Handbk. Irid. 161. 1892 et Fl. Cap. 6: 77. 1896.

Perianth tube short (up to 1·8 cm. long), cylindrical, slender, rarely slightly expanded to the throat; lobes longer than the tube, usually connate for 1—2 mm. above the throat and hypocrateriform; stamens arising in throat of perianth tube, well exserted, the filaments not decurrent, often connivent at the base and sometimes partly or entirely connate.

(Exceptions: Perianth lobes sometimes as long as tube in *I. monadelpha*. Perianth tube subinfundibuliform in *I. purpureorosea* and sometimes in *I. flexuosa*).

Type species: *I. polystachya L.*

14. **I. polystachya** L. Sp. Pl. ed. 2. 1: 51. 1762 (Mill. Ic. t. 155. f. 2. 1757, sine nom.); Burm. f. Fl. Cap. Prod. 1. 1768, pro parte; Ait. Hort. Kew. 1: 58. 1789; Andr. Bot. Rep. t. 155. 1801; Baker, Handbk. Irid. 161. 1892 et Fl. Cap. 6: 77. 1896; Dur. & Schinz, Consp. Fl. Afr. 185. 1895; Lewis, Fl. Pl. Afr. t. 968. 1945–6 et in Adamson & Salter Fl. Cap. Pen. 249. 1950. *I. erecta* Berg. Pl. Cap. 5. 1767; Ker, Bot. Mag. t. 623. 1803. *I. serotina* Salisb. Prod. 34. 1796. *I. leucantha* Jacq. Ic. t. 278. 1786—93 et Coll. Suppl. 11. 1796; Baker, Handbk. Irid. 162 et Fl. Cap. 6: 79, pro parte; Dur. & Schinz, l. c. 184. *I. patens* Ait. var. *leucantha* (Jacq.) Ker, Gen. Irid. 98. 1827. *I. maculata* sensu DC. in Red. Lil. t. 137. 1805.

I. maculata var. *caesia* Ker, Bot. Reg. t. 530. 1821. *I. viridiflora* var. *caesia* (Ker) Baker, Journ. Linn. Soc. Bot. 16: 92. 1877, Handbk. Irid. 164 et Fl. Cap. 6: 82; Dur. & Schinz, l. c. 187. *I. aristata* Ker var. *elegans* (Regel) Baker, Handbk. Irid. 162, non Fl. Cap. *I. elegans* (Regel) N. E. Br. Journ. Linn. Soc. Bot. 48: 43. 1928. *Wuerthia elegans* Regel, Bot. Zeit. 9: 596. 1851 et Gartenfl. 98. t. 46. f. 2. 1853. *Ixia palliderosea* Eckl. Top. Verz. 24. 1827, *nomen nud.*

Corm ovoid, globose or depressed-globose, 0·8—2·5 cm. diam.; tunics of pale or reddish brown fine reticulate fibres, sometimes papyraceous. *Stem* 30 cm. to 1 m. high, slender, simple or with 1—4 slender suberect to erect branches, in more robust plants the stem and branches stouter and the branches often patent. *Basal sheaths* 2, acute or acuminate, up to 12 cm. long, soon disintegrating. *Leaves* 5—8, distichous, erect or suberect, linear or lanceolate, usually reaching above middle of stem, sometimes nearly to the top, 2—8 mm. wide or sometimes up to 1·4 cm. in robust plants, soft and grass-like or moderately firm. *Spike* varying from lax and many-flowered to short, few-flowered and compact. *Bract* ovate or oblong, 3—7 mm. long (up to 9 mm. in robust plants), obtuse, subacute or shortly cuspidate, occasionally with 2 short teeth and a cusp, pellucid, whitish, sometimes minutely flecked with brown at the apex, occasionally subcarinate or faintly striate with pale slightly raised nerves; *bracteoles* bicarinate, bidentate or bicuspidate. *Flowers* faintly scented, variable in colour and size, white, pale mauve, pinkish mauve or pale to deep mauve or bluish, with or without a small stain of yellow, blue, green, mauve or purple in the middle, the outer lobes often tinted with blue or green outside; *perianth tube* exserted from bract, cylindrical, usually filiform, 0·5—1·4 cm. long; *lobes* usually about twice as long as tube, connate for 0·5—1 mm., patent, oblong or obovate-oblong, obtuse (rarely subacute), 1—2·5 cm. long, 5—9 mm. wide. *Stamens* arising at top of tube; filaments 3—4 mm. long, sometimes blue; anthers linear, usually diverging, 4—7 mm. long. *Ovary* rotund, 2—3 mm. long; style reaching to base or middle of filaments or to base of anthers, the branches blue, yellow or white, linear, conduplicate, 3—4 mm. long, falcate or recurved, the upper half minutely ciliate.

Holotype. Miller Ic. t. 155. f. 2.

Flats, hills and mountain slopes, generally in shade, marshy ground or near streams.

Flowering period. October—December.

CLANWILLIAM. Between Theerivier and Keerom, *Pillans* 8674 (BOL, SAM); Warm Baths, *L. Bolus* (BOL 20402, K); *van Zyl*, NBG 616/27 (BOL); Cedarberg, *Wettstein* 39, 42 (M).

CERES. Witels Kloof, off Michells Pass, *Esterhuysen* 14130 (BOL, NBG, PRE); Ceres, *Calderwood*, NBG 2596/29 (BOL).

TULBAGH. *Pappe* (SAM 20899); *Ecklon* and *Zeyher* 83 (SAM, S); *du Toit*, NBG 941/60 (NBG); Winterhoek, *Pappe* (SAM 48564); Witzenberg, *Zeyher* 4006 (PRE, SAM).

WORCESTER. *Zeyher* (K); *Cooper* 1629 (K), 1689 (BM, K); Bothashalt, *van Breda* 541 (PRE), 910 (NBG, PRE); Wolvekloof Forest Reserve, Bains Kloof, *Barker* 4264 (NBG); Worcester, near Waterfall, *Ecklon* and *Zeyher* 267 (S).

CAPE. Camps Bay, *Zeyher* (SAM 48569); Lions Head, *Marloth* 11978 (PRE); *Worsdell* (K); Table Mt., *Pappe* (BM, K, SAM); *Zeyher* (SAM); *MacGillivray* 476 (K); *Marloth* 597 (PRE); *Rehman* 606 (Z); near Kasteelspoort, *MacOwan* HNAA 264 (BM, BOL, K, SAM, UPS); Devils Peak, *Zeyher* (BOL 26877); *Dod* 400 (BOL, K); *Bolus* 3320 (BM, BOL, K); above Groot Schuur, *Dod* 386 (BM, K); near Rondebosch, *Burchell* 184 (K); *Bolus* 3320 (BOL); near Bishopscourt, *Rogers* (BM); Claremont, *Salter* 8901 (SAM); near Swartrivier, *MacOwan* 2555 (BOL, K); Kirstenbosch, *Lewis* 948 (SAM), 5753 (NBG); *Barker* (BOL 26875); *Acocks* 5388 (S); top of Skeleton Ravine, *Lewis* 679, 949 (SAM); *Leighton* 739 (BOL); *Esterhuysen* 12308 (BOL); between Skeleton and Window Gorges, *Esterhuysen* 10578 (BOL, PRE); Cecilia, *Barker* 4287 (NBG); Orange Kloof, *Dod* 401 (BM, BOL, K); near Constantia Nek, *Lewis* 1629 (SAM); Chapmans Peak, *Lewis* 651 (SAM); *Compton* 15441 (NBG); near Hout Bay, *MacOwan* 2555 (S); Glencairn, *Schmidt* 279 (M); S. of Simonstown, *Salter* 8553 (SAM); Witsands, *Linley* (SAM 56466).

PAARL. Near Du Toits Kloof, *Drege* 8370 (L); *Pillans* 8444 (BOL); Paarl Mts., *Drege* 8362 (K, L); Groot Drakenstein Mts., *Wasserfall* 717, 718 (NBG); Klapmuts Hill, *Marloth* 11968 (PRE).

WELLINGTON. Bains Kloof, *Worsdell* (K).

STELLENBOSCH. Jonkershoek, *Garside* 1170 A (K); *Compton* 15315 (NBG); *Wicht* (PRE 27245, BR, K, SAM); *Borchardt* (BOL).

SOMERSET WEST. Helderberg, *Stokoe* (BOL 17624); Hottentots Holland Mts., near Diep Gat, *Stokoe* (SAM 58726).

CALEDON. Steenbras, *Middlemost*, NBG 2025/26 (BOL); near Kogel Bay, *Leighton* 1423 (BOL); *Compton* 17549 (NBG); Palmiet River Valley, near Grabouw, *Bolus* 4214 (BOL, K, Z); Aries Kraal, *Lewis* 930 (SAM); *Barker* 3345 (NBG); Caledon, *Grey* (K); between Bot River and Hawston, *Pillans* 6714 (BOL, K); Lindeshof, *Lewis* 5659 (NBG); Genadendal, *Drege* 8377 (L).

WITHOUT LOCALITY. *Ecklon* and *Zeyher* 446 (BOL, S), 80 (SAM); *Thom* 272 (K); *Burchell* (K); *Drege* 8365 (K, L); *Ecklon* and *Zeyher* 77. 10 (L, Z—*I. pallideroseа* Eckl.); *Sparrman* (LINN, sheet 58.31); *Burmann* (G); *Thunberg* (UPS—*I. polystachya* sheet a).

Linnaeus described *I. polystachya* in 1762 when he founded the species on a plant figured in 1757 by Miller, Ic. t. 155, f. 2, and this figure must be regarded as the type of the species since none of the three sheets named *I. polystachya* in the Linnaean Herbarium can be the type. Two of them, 58.31 and 58.33, are marked "Sp"., indicating that they were collected by Sparrman who did not sail for South Africa until ten years after the name was published. There is no note on the origin of the third sheet, 58.32, which is named *I. polystachya* with the specific names *alba* and *flexuosa* crossed out, but it does not match Miller's figure nor agree with Linnaeus' description as the portion of the plant which is mounted has an unbranched stem and the flowers are not white but appear to have been mauve with a darker stain in the middle. Its general appearance, with a spike more than 15 cm. long, on which a number of fairly large flowers are open together, is of *I. viridiflora,* and it may possibly be a cross between that species and *I. polystachya.* Sparrman's specimens on sheet 58.31 match Miller's figure, except perhaps in colouring, and are *I. polystachya,* but the plant on sheet 58.33 has a few small yellow flowers in a short compact spike and appears to be *I. odorata.*

Typical *I. polystachya* usually has a fairly tall slender branched stem, rather lax spike, short colourless bracts which are sometimes minutely flecked with brown at the apex, smallish flowers with a filiform tube about half as long as the lobes, linear diverging anthers about twice as long as the filaments and the style reaching to the top of the perianth tube with linear falcate branches emerging at the base of the filaments and equal to them in length. The length of the style is variable, however, and it sometimes extends up to the base of the anthers, but as flowers with short and long styles have been observed in the same spike, those above the base having a longer style than those below, it is not a case of the style elongating as the flower matures.

There is a great deal of variation in the size of the plants and flowers as well as the colour of the flowers which ranges from pure white or white tinged with blue or green on the outside and with or without a stain of colour in the middle, to the various shades mentioned above in the description. One of Sparrman's specimens on sheet 58.31, named *I. polystachya* by Linnaeus, has a distinct dark stain in the middle of the flower. Confusion was caused by some of the early botanists, such as Thunberg and Jacquin, who attached considerable importance to the presence or absence of a stain and used this as a character to distinguish *I. maculata* from *I. polystachya.* Several of the flower spikes figured as varieties of *I. maculata* by Jacquin on plates 21 and 22 of his Hortus Schoenbrunniensis are colour variations of *I. polystachya,* many are hybrids and none of them is *I. maculata* L.

The plant figured in 1821 on plate 530 of the Botanical Register is a colour form of *I. polystachya* with pale mauve flowers, with a small greenish stain in the centre. Plants which match this figure have been collected in the vicinity of Tulbagh. Ker named it *I. maculata* var. *caesia*, but that he was in some doubt about the difference between *I. maculata* and *I. polystachya* is clear from the following remarks he made about the former: "As a species, we confess, we can find no other line of demarcation between it and *erecta* (i.e. *I. erecta* Berg., a synonym of *I. polystachya* L.), variable in the same way and to the same extent, but the circular spot in the centre of the limb of the first, which is not in the latter, nor should we have separated the two had we not found them established by former botanists of eminence."

A form of *I. polystachya* fairly common on the Cape Peninsula has a simple or branched stem, a shorter and more compact spike than the typical, the style reaching to the middle of the filaments or base of the anthers and the anthers more or less erect and as long as the filaments or only 1—2 mm. longer. Some of these plants exactly match Jacquin's figure of *I. leucantha* and this name has therefore been cited above as a synonym of *I. polystachya*. On the lower mountain slopes at Kirstenbosch this short-spiked form occurs together with the typical but on the higher slopes above it predominates and is mixed with what appear to be hybrids with *I. odorata* which grows in the same area and flowers at the same time. Baker evidently confused *I. leucantha* with *I. campanulata* as the collections cited by him under the former are white-flowered plants of *I. campanulata* or, under the var. *aristata*, white flushed with red outside.

In the Flora Capensis Baker gave three varieties of *I. polystachya*, var. *ornata* Baker, var. *bicolorata* (Klatt) Baker and var. *flavescens* (Eckl.) Baker. The last is *I. odorata* but the identity of the other two is uncertain. The only description given for var. *ornata* is "segments tinged with red outside", and as Baker did not cite any specimens it is impossible to come to any conclusion about this. The second was a new status for *I. bicolorata* Klatt, but Baker did not see the type, which is no longer in the Berlin-Dahlem Herbarium and is presumed to have been destroyed during the last war. From Klatt's description this might perhaps have been a form of *I. dubia*.

The type of *I. hybrida* Ker (in Koenig & Sims Ann. 1: 227. 1805) is the plant figured on plate 127 in the Botanical Magazine, where it was identified as a variety of *I. flexuosa* by Curtis. No form of *I. polystachya* with the same colouring—white flushed with pink outside and with a pink stain in the middle—has been observed in the field and the plant figured is probably of hybrid origin, with *I. polystachya* as one of the parents. Baker upheld *I. hybrida* as a separate species "intermediate between *I. polystachya* and *maculata*" and described the flowers as having a distinct blotch of black in the throat (Handbk. Irid. 161 and Fl. Cap. 6: 78). Some of the collections he cited are *I. metelerkampiae* L. Bol.

No botanists have agreed about the identity of the *Ixia* figured as *Wuerthia elegans* by Regel in 1853. Klatt cited *W. elegans* as a synonym of *Ixia tenuifolia* Vahl but it is very unlikely that this is correct as Regel's figure does not agree with Vahl's description, nor do specimens in the Stockholm Natural History Museum Herbarium which were identified as *I. tenuifolia* by Klatt (see note under *I. framesii*). According to Baker *Wuerthia elegans* is a variety of *Ixia aristata* Ker (= *I. longituba* N. E. Br.), and he established it as such in his Handbook of the Iridaceae where he cited only the type figure. In the Flora Capensis he cited *Zeyher* 4014 under *I. aristata* var. *elegans*, but the flowers of Zeyher's specimens are quite unlike those of *I. longituba*, nor do they match the figure of *Wuerthia elegans*, being very much smaller with a funnel-shaped perianth tube and very short filaments included in the tube (see *I. stohriae*).

In 1928 N. E. Brown made a new combination, *I. elegans* (Regel) N. E. Br. and stated that *I. aristata* sheet *b* of Thunberg was this species, and that Thunberg's specimens were identical with unlocalised ones in Kew Herbarium collected by Dr. Thom. When I examined these plants myself I found that I could not agree about either of these statements and consider that sheet *b* of *I. aristata* Thunb. is a form of *I. campanulata* Houtt. (see note under that species), while Dr. Thom's plants are a narrow-leafed variety of *I. patens*. In both of these collections the perianth tube is very short indeed and there is no dark stain in the middle of the flower so neither matches the plant figured as *Wuerthia elegans*. In my opinion Regel's plate represents a narrow-leafed unbranched form of *I. polystachya* and I have accordingly added his name to the list of synonyms above.

Var. **lutea** (Ker) Lewis comb. nov. *I. erecta* Berg. var. *lutea* Ker, Bot. Mag. t. 846. 1805. *I. erecta* Jacq. Hort. Schoenbr. t. 18 (fig. maj.) 1797. *I. lutea* (Ker) Baker, Journ. Linn. Soc. Bot. 16: 91. 1877; Handbk. Irid. 162. 1892 et Fl. Cap. 6: 79. 1896; non Eckl. 1827. *I. aurantiaca* Klatt, Abh. Naturf. Ges. Halle 12: 397 et Erganz. 63. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 182. 1895.

Differs from var. *polystachya* in colour only, the flowers golden or orange-yellow, rarely with a small dark stain in the middle, the outer lobes sometimes reddish or purplish outside. *Filaments* yellow or dark. *Style* usually reaching to base of filaments.

Lectotype. Botanical Magazine t. 846.

Mountain slopes up to 4,000 ft. alt. in the Paarl and Stellenbosch Divisions.

Flowering period. November—December.

PAARL. Wemmershoek Mts., *Compton* 10145 (NBG); *Esterhuysen* 4101 (BOL); Wemmershoek, *Compton* 4839 (BOL, NBG); *Salter* (BOL 26914); near Pniel, *Wasserfall* 748 (NBG); Drakenstein Mts., *Galpin* 12281 (K, PRE); French Hoek Mts., *Salter* 4189 (K).

STELLENBOSCH. Banhoek, near Stellenbosch, *Stanford* (BOL 19951); Jonkershoek, *Rycroft* (BOL 26852).

Ker placed this variety as a variety of *I. erecta* Berg., a synonym of *I. polystachya* L., but Baker and Klatt both regarded it as a distinct species, the former adopting Ker's varietal epithet while the latter renamed it *I. aurantiaca*. Except for the colour of the flowers it does not differ in any way from *I. polystachya* and I have therefore followed Ker in treating it as a variety. As in var. *polystachya*, plants from higher altitudes are more slender, often with a simple stem, and have a shorter and more compact spike and smaller flowers than those at lower altitudes.

Var. **crassifolia** Lewis var. nov. *I. maculata* var. Jacq. Hort. Schoenbr. t. 19. 1797.

A var. *polystachya* tunicis cormi durioribus, foliis robustioribus marginibus plus minusve prominentibus spica densiora bracteis imbricatis aliquid striatis, differt.

Cormus subglobosus, 1—2 cm. diam., tunicis e fibris sat robustis parallelis erectis compositis. *Caulis* 25—45 cm. altus, simplex vel ramis 1—2 patentibus vel erectis. *Folia* 4—6, lanceolata vel ensiformia, firma, plerumque multinervata marginibus et nervo medio prominentibus, spiraliter torta, ad medium caulis attingentia, 0·5—1·2 cm. lata. *Spica* brevis, compacta et pauciflora vel longior et dense multiflora. *Bractea* oblonga vel oblongo-ovata, 0·5—1 cm. longa, acuta vel cuspidata, interdum tricuspidata vel cuspe et dentibus duobus brevibus instructa, sine colore vel pallide rosea, plerumque leviter striata; *bracteolae* parum ultra medium coalitae. *Flores* plerumque subparvi, subcaerulei vel lilacini vel purpurini ad medium macula cyanea vel purpurea notati: *perianthii tubus* filiformis, 0·7—1 cm. longus; *segmenta* elliptica vel obovato-oblonga, 1—1·7 cm. longa, 5—9 mm. lata. *Stamina* patentia, filamentis 3—4 mm. longis et antheris 6—8 mm. longis. *Stylus* ad apicem tubi perianthii attingens, ramis falcatis 3—4 mm. longis.

Differs from var. *polystachya* in having harder corm tunics, firmer leaves with more or less prominent margins, and a more compact spike with somewhat striate imbricate bracts.

Corm subglobose, 1—2 cm. diam.; tunics of fairly firm parallel vertical fibres. *Stem* 25—45 cm. high, simple or with 1—2 patent or erect branches. *Leaves* 4—6, reaching to about middle of stem, lanceolate or ensiform, 0·5—1·2 cm. wide, firm, usually many-veined with the margins and mid-rib prominent, spirally twisted. *Spike* short, compact and few-flowered or longer and closely many-flowered. *Bract* oblong or oblong-ovate, 0·5—1 cm. long, acute or cuspidate, sometimes tricuspidate or with a cusp and 2 short teeth, pallid or pinkish, usually striate with several slightly prominent pale nerves; *bracteoles* united to shortly above the middle. *Flowers* usually fairly small, pale blue, pinkish mauve or purplish with a dark blue or purplish stain in the middle; *perianth tube* filiform, 0·7—1 cm. long; *lobes* elliptic to obovate-oblong, 1—1·7 cm. long, 5—9 mm. wide. *Stamens* patent, often lying parallel with the lobes; filaments 3—4 mm. long; anthers 6—8 mm. long. *Style* reaching to top of perianth tube, the branches falcate, 3—4 mm. long.

HOLOTYPE. *Schelpe* 4225 in South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Flats and hills in the Hopefield, Malmesbury and Wellington Divisions.

Flowering period. October.

HOPEFIELD. Near Hopefield, *Leipoldt* (BOL 21666, SAM); *Letty* 119 (PRE); *Bachmann* 1214 (Z).

MALMESBURY. One mile N. of Malmesbury, *Schelpe* 4225 (BOL, SAM); *Lewis* 5748 (NBG); near Riebeek Kasteel, *Leipoldt* 3819 (BOL); *Barker* 1566 (NBG); Botmas Pass, *Pillans* (BOL 26881); near Groenekloof, *Ecklon* 441 (G, K, M, PRE, S), 442 (K, M, PRE, Z); slopes of Paardeberg, *Pillans* 7784 (BOL).

WELLINGTON. Koopmans River, *Zeyher* (SAM 20930).

WITHOUT LOCALITY. *Zeyher* (K); *Lamarck* (P); *Martin* in Herb. Lamarck No. 672 (P); *Burmann* (G—2 sheets, one named *I. polystachya* var. *violacea* and other *I. erecta* vel *I. polystachya*); *Brehm* (BR).

In some collections this variety has been identified as *I. monadelpha* or *I. columellaris* (= *I. monadelpha*) but the filaments are completely free and widely spreading, the anthers in mature fully open flowers often lying more or less parallel with the lobes, and the style does not reach above the throat of the tube, with its linear branches spreading at the base of the lobes. Even when these organs are concealed in dried herbarium specimens the plants can still be distinguished from *I. monadelpha* by their more or less striate bracts which are not dark at the apex.

Among the collections cited above are some with a branched stem, short compact spikes and blue flowers with narrow elliptic lobes, which exactly match the plant figured as a variety of *I. maculata* by Jacquin on plate 19 of this Hortus Schoenbrunniensis. As has been explained above in a note under var. *polystachya*, Jacquin confused *I. maculata* with *I. polystachya* and referred to the former any colour form or variety of *I. polystachya* with a dark stain of colour in the middle of the perianth.

15. **I. flexuosa** L. (Fig. 3), Sp. Pl. ed. 2. 51. 1762 (Mill. Ic. t. 156. f. 2. 1757, sine nom.); Ker, Bot. Mag. t. 624. 1803 et Gen. Irid. 97. 1827, excl. syn. *I. capitata* Andr.; Ait. Hort. Kew. 1: 58. 1789; Klatt, Linnaea 34: 642. 1866; Baker, Handbk. Irid. 161. 1892 et Fl. Cap. 6: 78. 1896, pro parte; Dur. & Schinz, Consp. Fl. Afr. 5: 183. 1895, excl. syn. *I. thyrsiflora* De la R. *I. polystachya* D.C. in Red. Lil. t. 126. 1805.

Corm ovoid or subglobose, 0·8—1·3 cm. diam.; tunics of fine fibres, vertical below becoming confluent and reticulate above. *Stem* 35—65 cm. high, slender, often filiform, simple or with 1—3 short erect branches. *Leaves* 3—5, linear, linear-lanceolate or subulate, 5—35 cm. long, 2—5 mm. wide, erect, suberect or the outer sometimes short and more or less patent, usually 5-nerved with the mid-rib slightly prominent, usually spirally twisted. *Spike* short, compact and subcapitate, closely 3—15-flowered or occasionally slightly longer and laxer, the rachis more or less flexuose with the bracteoles adpressed to the curves. *Bract* ovate, 5—7 mm. long, shortly tricuspidate or tridentate or with a short cusp and 2 very short teeth, pellucid, usually pinkish with a few fine dark veins; *bracteoles* bicarinate, bicuspidate. *Flowers* faintly scented, small, pale pink, mauve or white, sometimes yellowish in the middle, the white flowers often with deep pink or purplish veins radiating out from the base of the lobes; *perianth tube* filiform, 4—6 mm. long; *lobes* often somewhat campanulate at the base when flowers not fully open, connate for about 1 mm., oblong, obtuse, 1—1·6 cm. long, 5—8 mm. wide, subequal or the outer slightly shorter and wider than inner. *Stamens* arising at top of perianth tube, the filaments 3·5—4·5 mm. long, fairly wide at the base and tapering upwards; anthers linear-oblong, 3—4·5 mm. long. *Ovary* rotund, 2·5—3 mm. long; style reaching to middle of filaments or base or middle of anthers, the branches oblanceolate or linear and slightly expanded towards the apex, conduplicate, 2—4 mm. long.

HOLOTYPE. Miller Ic. t. 156, f. 2.

Flats, hills and mountain slopes in clay or sandy soil.

Flowering period. August—September, occasionally also July or October.

CAPE. Near Cape Point, *Taylor* 1822 (SAM), 42 (BOL).

PAARL. French Hoek Mts., *Schlechter* 9359 (BM, BOL, BR, G, L, K, S, PRE).

STELLENBOSCH. Banhoek, *Stanford* (BOL); Jonkershoek, *Lewis* 1994 (SAM).

SOMERSET WEST. Vergelegen, *Johnson* (NBG); Hottentots Holland Mts., *Prior* (K).

CALEDON. Lower slopes of Houwhoek Mts., *Wilman* 839 (BOL, NBG); between Caledon and Bot River, *Bond* 142 (NBG); Langhoogte,

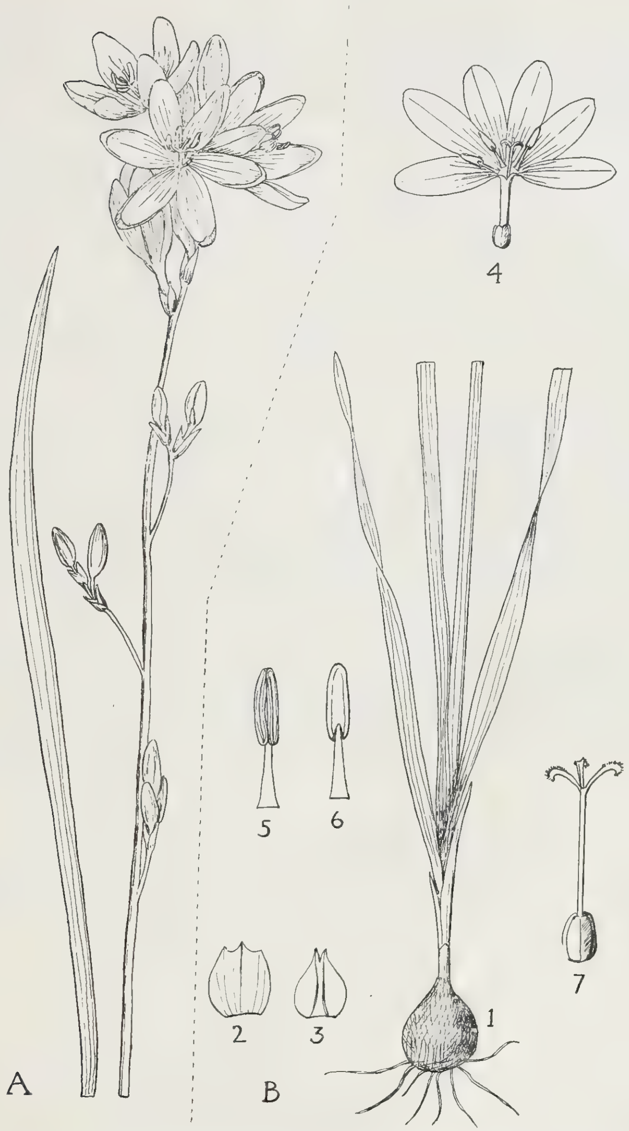


FIG. 3.—*I. flexuosa.* A. Copied from Bot. Mag. t. 624. B. *Lewis* No. 5574. 1. Corm and lower part of leaves. 2. Bract × 2. 3. Bracteoles × 2. 4. Flower laid open. 5. Stamen, front view, × 3. 6. Stamen, back view, × 3. 7. Gynaecium × 2. Del. G. J. Lewis.

near Bot River, *Ecklon* and *Zeyher* 90 (SAM); near Bot River, *Salter* 6173 (BOL); between Bot River and Hawston, *Lewis* 5291 (NBG); near Kleinmond, *Esterhuysen* 2937 (BOL); Caledon, *Garside* 78 (K); *Marloth* 7101, 9234 (PRE); *Barker* 112 (BOL, K); *Schlechter* 5554 (PRE); Swartberg, Caledon, *Worsdell* (K); between Villiersdorp and Caledon, *Barker* 111 (BOL, K); Shaws Mt., *Martley* (BOL 26932); S. of Shaws Mt., *Gillett* 4433 (BOL); between Hermanus and Stanford, *Gillett* 4169 (BR); near Stanford, *Leighton* 1938 (BOL); between Gansbaai and Danger Point, *Stokoe* (SAM 55627); between Caledon and Napier, *Esterhuysen* 3058 (BOL); Genadendal, *Pappe* (SAM 48561); *Prior* 162 (K); *Drege* 8377 (K, S); Greyton, *Lindeberg* (S); near River Sonderend, *Heginbotham* 66 (NBG); *Esterhuysen* 10359 (BOL, PRE); *Zeyher* 4012 (SAM); *Schlechter* 5621 (BM, K, SAM, Z); *Penther* 588 (Z); Appels Kraal, *Stokoe* (SAM 59778).

BREDASDORP. Fairfield, *Lewis* 5287 (NBG); near Elim, *Frowein* (PRE); *Barker* 8471 (NBG); near Bredasdorp, *Barker* 5561 (NBG); *Compton* 9041 (NBG); Soetendals Vlei, *Acocks* 15490 (PRE); the Poort, *Barker* 2507 (BOL, NBG); *Dymond* (BOL 21226, SAM); Napier, *Bond* 468 (NBG); Potberg, *Esterhuysen* 23228 (BOL); *Pillans* 9445 (PRE); Cape Agulhas, *Leipoldt* 3605 (BOL); Brandfontein, *Esterhuysen* 19019 a (BOL).

SWELLENDAM. Breederivier, near Swellendam, *Drege* 8371 (K, L, S).

HEIDELBERG. Between Swellendam and Heidelberg, *Lewis* 5574 (NBG).

RIVERSDALE. Five miles S. of Riversdale on Blombos road, *Lewis* 5635 (NBG); Vermakkelykheid, *Muir* 2697 (PRE).

WITHOUT LOCALITY. *Ecklon* and *Zeyher* (PRE—*I. palliderosea* Eckl.).

The following collections from the Clanwilliam Division appear to be a distinct form or variety of *I. flexuosa*, or may perhaps be a separate species, but as all except one of the specimens seen are incomplete, and no living plants have been seen, it is not possible to come to any decision about this at present. There is no note on the colour of the flowers which are a dull brown in the dried state but in living plants are probably deep pink or red.

CLANWILLIAM. Cedarberg, *Pattison* (BOL 13925); Clanwilliam, *Mader* 103 (K); Pakhuis Pass, *Thode* A 2138 (K).

As in the case of *I. polystachya*, Linnaeus described this species in 1762 from a plant figured by Miller five years earlier, and as there is no specimen of *I. flexuosa* in the Linnaean Herbarium, Miller's figure must be accepted as the type. It is a fairly good one of the typical common form, with a compact spike of several small flowers. There is an excellent illustration in the Botanical Magazine, t. 624, showing more details of the stamens and style, and here Ker commented on the "vague and inappropriate" name as follows: "Although Linnaeus has given it the specific name of *flexuosa*, yet in his description he says it is '*a flore ad florem parum flexus*' ".

Although they can readily be distinguished in the living state, it is difficult to define the distinction between this species and *I. polystachya* as the latter is so variable that some of its forms have characters more or less the same as those of *I. flexuosa*. On the whole *I. flexuosa* is a much more delicate species, with narrower leaves, a more slender, often hair-like stem, the spikes usually more compact and the flowers with different colouring and markings and small anthers about as long as the filaments. The corm is usually smaller, with slightly firmer tunics. It flowers in early spring and usually grows in open places on flats or hill or mountain slopes, whereas *I. polystachya* flowers from October to December and is more often found in shade or semi-shade or somewhat marshy ground, and in the typical form the stem is less slender with longer branches than in *I. flexuosa*.

I. flexuosa has at times been confused with other species, as for example in Burmann's Herbarium where several different species were placed under this name. *I. thyrsiflora* De la Roche, which Baker cited as a synonym, is *Aristea thyrsiflora* (De la R.) N. E. Br. Baker also followed Ker in citing *I. capitata* var. *stellata* Andr. Bot. Rep. t. 232 as a synonym but the plant figured by Andrew has a funnel-shaped perianth tube and is a form of *I. latifolia*. The plant described as *I. polystachya* var. *flexuosa* by Lamarck (Encyc. 3: 339 (1789)) is probably *I. odorata*, judging from his description and a specimen in his herbarium named by him "*I. polystachya* var.".

16. **I. stolonifera** Lewis, Ann. S. Afr. Mus. 40: 14. 1952.

Corm small, globose, 5—8 mm. diam.; tunics of very fine submembranous reticulate fibres. *Stem* 21—50 cm. high, usually about 40 cm., simple or with 1 short branch near the top. *Basal sheaths* 2, membranous, 2·5—8·5 cm. long; short stolons bearing clusters of very small bulbils at the apex arise in the axils of the sheaths and corm tunics. *Leaves* 3, suberect, lanceolate, 18—30 cm. long, 0·3—1 cm. wide, flaccid, half sheathing. *Spike* 3—6 cm. long, closely 6—12-flowered. *Bract* 7—8 mm. long, tricuspidate, the cusps with long setaceous tips 3—4 mm. long, pellucid, mauve at the base with 3 or 5 purplish veins; *bracteoles* bifid with 2 long setaceous cusps. *Flowers* small, pale greyish mauve with a small purple circular stain in the middle; *perianth tube* cylindrical, 2—4 mm. long, not exserted from the bract; *lobes* ovate, 0·9—1·2 cm. long, 6—7 mm. wide. *Stamens* arising at top of perianth tube, the filaments 2 mm. long, purple; anthers yellow, 5—6 mm. long. *Ovary* ovoid, about 3 mm. long; style reaching to base of anthers, the branches patent, 3 mm. long, linear, conduplicate, minutely ciliate towards the apex.

HOLOTYPE. *Lewis* 1605 in South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Shaded mountain slopes at about 3,000 ft. altitude on the borders of the Montagu and Worcester Divisions.

Flowering period. September.

MONTAGU. Kiesiesberg, lower slopes, 3,000 ft., *Lewis* 1605 (BOL, NBG, SAM); *Compton* 18524 (NBG).

I. stolonifera is known only from the one locality recorded above. The long setaceous cusps of the bracts and bracteoles distinguish it from *I. polystachya* and *I. flexuosa*, its nearest allies. The bulbiferous stolons are uncommon in the genus but are known to occur also in *I. polystachya*, *I. maculata* and *I. paniculata*.

17. **I. viridiflora** Lam. Encyc. 3: 340. 1789 et Illustr. 1: 112. 1791; Lodd. Bot. Cab. t. 1548. 1829; Klatt, Abh. Naturf. Ges. Halle 12: 397. 1882; Baker, Handbk. Irid. 164. 1892 et Fl. Cap. 6: 82. 1896; Dur. & Schinz, Consp. Fl. Afr. 5: 186. 1895; Marloth, Fl. S. Afr. 4: 146. t. 42 c. 1915. *I. maculata* var. Thunb. Diss. Ix. n. 19. 1783, pro parte. *I. maculata* var. *viridis* Jacq. Hort. Schoenbr. t. 23. 1797; Ker, Bot. Mag. t. 549. 1802; Reichb. Fl. Exot. 4. t. 256. 1835. *I. spectabilis* Salisb. Prodr. 35. 1796. *I. spicata* var. *viridi-nigra* Andr. Bot. Rep. t. 29. 1799. *I. viridis* Thunb. Fl. Cap. 1: 242. 1811 et Ed. Schultes 62. 1823. *I. pulchra* Salisb. Trans. Hort. Soc. 1: 320. 1812. *I. prasina* Soland. ex Baker in Journ. Linn. Soc. Bot. 16: 92. 1877, *nomen nud.*

Corm subglobose, 1—2 cm. diam., usually about 1 cm.; tunics of pale brown fairly fine reticulate fibres. *Stem* 50—95 cm. high, simple or occasionally with 1—2 short erect branches. *Leaves* 5—7, linear, erect, 40—55 cm. long, 2—4 mm. wide, fairly prominently 4—6-nerved, often reaching to or above the base of the terminal spike. *Spike* 12—30 cm. long, 12—many-flowered, usually lax and with many flowers open together, occasionally shorter and more compact. *Bract* oblong, obtuse or acute, 0·8—1 cm. long, opaque, straw-coloured, with 1 distinct vein; *bracteoles* slightly shorter than bract, bicarinate, bidentate. *Flowers* largish, green with a conspicuous purple, purple-black or reddish circular stain in the middle; *perianth tube* filiform, 6—9 mm. long, sometimes becoming curved as the flower matures; *lobes* connate for about 1 mm., patent, subequal, oblong, obtuse or subacute, 1·6—2·5 cm. long, 0·7—1·1 cm. wide. *Stamens* arising at throat of perianth tube, the filaments purple, 3—4 mm. long; anthers purple or yellow, linear, subacute, 0·9—1·3 cm. long. *Ovary* oblong or obovoid, about 4 mm. long; style reaching to top of perianth tube, the branches falcate, 3 mm. long, linear, conduplicate, minutely ciliate.

Holotype. *Lamarck* in Herb. Lamarck, Natural History Museum Herbarium, Paris.

Lower slopes of mountains in the Tulbagh district.

Flowering period. September—October.

TULBAGH. *Pappe* (S); *Thunberg* (S, UPS); *Ecklon* and *Zeyher* 89 (G); *Ecklon* and *Zeyher* (76.9) (BR, PRE, UPS, Z); *Ecklon* 439 (G, K, M, PRE, Z); *MacOwan* 2692 (K); HNAA 542 (BM, BOL, G, K, UPS); *Sidey* 2399 (S); *Brehm* (BR, M); between Breede River and Bokkeveld, *Drege* (K).

Without Locality. *Drege* (G, L); *Drege* 8360 (P); *Lamarck* (P); *Masson* (LINN); *Jussieu* 3620 (P); *Burchell* (K); *Pappe* (BM, K); *Prior* (K, PRE); *Thom* 974 et *s. n.* (K); *Villett* (K); *Roxburgh* (BM); *Niven* (BM); *Harvey* 844 (BM, K); *Verreaux* (G); *Ecklon* and *Zeyher* 277 (G); *Ecklon* 440 (K, M, PRE); *Zeyher* (K—locality given is Clanwilliam Div. but this is probably incorrect).

The striking and uncommon colour of the flowers, usually long and comparatively lax spike and very long narrow anthers, distinguish this species from all others. As a rule a number of flowers on the spike are open together and persist for several days without fading and falling off as is usual in the genus. A less common form has a shorter and more compact spike and flowers with a reddish or maroon stain in the middle instead of the more typical purple or purple-black. Both forms were beautifully illustrated by Jacquin in 1797 on plate 23 of his Hortus Schoenbrunniensis.

In his Handbook of the Iridaceae and the Flora Capensis Baker gave two varieties, var *cana* (Eckl.) Baker, based on *I. cana* Eckl. (Top. Verz. 26, 1827), and var. *caesia* (Ker) Baker, the latter figured in 1821 on plate 530 of the Botanical Register where it was named *I. maculata* var. *caesia* by Ker. For the first Baker cited *I. maculata* var. *amethystina* Ker, Botanical Magazine t. 789, but having examined this figure and some specimens distributed by Ecklon as *I. cana* I am fairly certain that it is a hybrid, with *I. viridiflora* as one of the parents. The second is a form of *I. polystachya* and is discussed in a note under that species.

For two hundred years or more *I. viridiflora* has been a favourite of horticulturalists and it is now in danger of being exterminated in the Tulbagh district, the only area from which it has been recorded, though according to Marloth it occurred at one time in the Piketberg and Clanwilliam districts as well. For the present it is fairly well established in a few gardens and nurseries in Europe and South Africa and it is hoped that every effort will be made to preserve it in future.

Dr. Marloth, in his Flora of South Africa (vol. 4. p. 146), made the following note on the colour of the flowers: "The colour of the centre is not really black, but a dark indigo, due to the deep blue sap of the cells of the upper epidermis. The green portion contains no green pigment, the colour being due to the effects of interference of light, caused by the finely striated outer cell-wall and the highly refractive contents of the epidermal cells. In some of the inner cells of the petals occur very refractive angular granules, embedded in pale blue protoplasm, and these two substances may have a share in the production of the final result."

18. **I. patens** Ait. Hort. Kew. 1: 59. 1789; Sims, Bot. Mag. t. 522. 1801; Red. Lil. t. 140. 1806; Willd. Enum. 1: 56. 1809; Lodd. Bot. Cab. t. 1142. 1826; Reichb. Fl. Exot. 4. t. 256. 1835; Klatt, Linnaea 34: 646. 1866; Baker, Handbk. Irid. 163. 1892, et Fl. Cap. 6: 80. 1896; Dur. & Schinz, Consp. Fl. Afr. 5: 186. 1895. *I. patens* var. *kermesina* Regel, Gartenfl. t. 356. 1862. *Gladiolus pyramidalis* Burm. f. Prodr. Fl. Cap. 2. 1768. *Ixia aristata* sensu Schneev. Ic. t. 32. 1793. *I. flaccida* Salisb. Prodr. 35. 1796. *I. filiformis* Vent. Hort. Cels. t. 48. 1800; Red. Lil. t. 30. 1803; Vahl, Enum. 2: 63. 1806. *I. coccinea* Thunb. Fl. Cap. 1: 241. 1811, pro parte. *I. candida* Del. in Red. Lil. t. 426. 1814. *I. pallens* Ait. ex Steud. Nomen. 453. 1821. *I. densiflora* Klatt, Abh. Naturf. Ges. Halle 12: 397 et Erganz. 63. 1882. *I. angusta* L. Bolus, S. Afr. Gard. 21: 368. 1931; non Jacq. 1786—93. *I. dispar* N. E. Br. Kew Bull. 1929. 133—4. *I. campanulata* sensu Baker, Handbk. Irid. 162 et Fl. Cap. 6: 80. *I. punicea* Eckl. Top. Verz. 24. 1827, *nomen nud.*

Corm subglobose, 1·5—2 cm. diam.; tunics of fairly fine more or less reticulate fibres. *Stem* 18—50 cm. high, moderately stout, simple or with 1—2 short erect branches. *Basal sheaths* 2 or 3, 1—6·5 cm. long. *Leaves* 5—7, lanceolate or ensiform, ascending or erect, 10—35 cm. long, 0·6—1·2 cm. wide, reaching to middle of stem or sometimes to the top, often slightly twisted, firm with several fairly prominent veins and often narrow somewhat cartilaginous fairly prominent margins. *Spike* up to 10 cm. long, somewhat laxly 5—15-flowered, the rachis slightly flexuose with the bracteoles adpressed to the curves. *Bract* oblong or obovate-oblong, 6—8 mm. long, cuspidate, tricuspidate, tridentate or with a cusp and 2 short teeth, more or less pellucid, usually pinkish and faintly striate, or minutely speckled with brown; *bracteoles* bicarinate, bicuspidate. *Flowers* deep crimson, rose-purple or pale pink, rarely white, sometimes with a very small white or greenish circular mark at the centre and usually with well defined veins; *perianth tube* slender, usually filiform, 4—6 mm. long; *lobes* connate for 1—2 mm., patent, narrowly elliptic or oblong, obtuse, 1·6—2·4 cm. long, 0·5—1·2 cm. wide, equal or the outer slightly to distinctly wider than inner. *Stamens* arising at top of perianth tube, erect, the filaments 4—6 mm. long; anthers linear, 6—8 mm. long. *Ovary* rotund, 3—4 mm. long; style reaching to base of anthers or shortly above, the branches linear-oblanceolate, conduplicate, 3—4 mm. long, the upper third minutely ciliate.

HOLOTYPE. Hort. Kew. specimen (1778) in the British Museum.

Original locality somewhat doubtful as there are no recent authentic records but it probably extended from Clanwilliam to the Worcester and Caledon Divisions.

Flowering period. September—October.

CALVINIA. Grasberg, *Buhr*, NBG 296/36 (NBG); Nieuwoudtville, *Buhr*, STE 661 (BOL, type of *I. angusta* L. Bolus); STE 3760 (BOL). (These localities are doubtful as the plants are all from Mr. Buhr's garden).

CLANWILLIAM. *Mader* in Herb. MacOwan 2182 (K).

TULBAGH. *Pappe* (BM, SAM).

WORCESTER. Near Worcester, *Cooper* 3611 (K, type of *I. dispar*).

CALEDON. Near River Sonderend, *Galpin* 4684 (K, PRE).

WITHOUT LOCALITY. *Burmann* (G, type of *Gladiolus pyramidalis*); *Pappe* (BOL, SAM); *Zeyher* (SAM); *Thom* (K); *Drege s. n.* et 8359 (G); *Drege* 8358, 8378 (S); *Ventenat* (G, type of *I. filiformis*); *Burchell* (K); *Jussieu* 3621 (P); *Thunberg* (UPS, *I. coccinea* sheet b); *Jameson* (K); *Drege* (S—"Rondebosch, Witteboom und Zwischen Wynberg und Houtbaai"); *Thom* (K); *Brehm* (BR); *Ecklon* (S, *I. punicea* Eckl.).

It seems fairly certain that this beautiful species has been exterminated as there are no recent collections from the field. That it was a popular garden plant and largely cultivated in England and Europe during the second half of the eighteenth and early part of the nineteenth centuries is evident from the number of times it was figured and the various names by which it was known. In 1801 Sims noted in the Botanical Magazine, t. 522, that "this very shewy Ixia, the brilliancy of whose flowers it is impossible to imitate by art, . . . has been of late years frequently imported from Holland."

The first name to be published for this species is that of Burmann f., who in 1768 described a plant in his herbarium as *Gladiolus pyramidalis*. When N. E. Brown examined the South African Iridaceae in Burmann's herbarium he overlooked the type of *G. pyramidalis* and for various reasons came to the conclusion that a *Watsonia* specimen must have been the plant described, but as I explained in 1954 in a note published in the Annals of the South African Museum (Vol. 40, p. 132), the type, named by

Burmann, is in his herbarium and agrees with his description. However, his specific epithet cannot be used for this species as a species of *Lapeirousia* was named *Ixia pyramidalis* by Lamarck in 1789 (Encyc. 3: 334). The same year Aiton described plants of this *Ixia*, introduced into Kew Gardens by William Pitcairn ten years earlier, as *I. patens*, and as this is the oldest available name it is retained for the species. The type, which flowered at Kew in 1788, is in the British Museum Herbarium.

The plant described as *I. angusta* by Dr. L. Bolus has unusually narrow perianth lobes, only 3—6 mm. wide, and is an abnormal form; plants from the same collection which flowered two or three years later had larger flowers with lobes up to 1·7 cm. long and 1 cm. wide.

The type of *I. densiflora* Klatt has not been seen and is presumed to have been destroyed but from the description it is very possible that it was a form of *I. patens* and I have therefore followed Baker in citing *I. densiflora* Klatt as a synonym.

In Thunberg's herbarium there are two sheets named *I. coccinea*, the first being *I. campanulata* Houtt. and the second *I. patens*. There is a slight superficial resemblance between these two species but the corm and corm tunics are quite different, the leaves of *I. patens* are wider and firmer, the bracts longer, and there is a distinct difference in the texture and appearance of the flowers.

N. E. Brown pointed out that Baker had incorrectly described a plant from Worcester, *Cooper* 3611, as *I. campanulata* Houtt., and as he considered that it was a new species he named it *I. dispar*. There is a single specimen in Kew Herbarium and as far as can be seen—there are no flowers open—it is a small-flowered form of *I. patens*. It is very similar to *Mader* in Herb. MacOwan No. 2182, from the Clanwilliam Division, but has slightly longer and narrower leaves.

In the Bolus Herbarium there are some plants collected by Ross-Frames between Villiersdorp and Worcester (BOL 19913 and 26853) which also resemble *Cooper* 3611, but the flowers are pale pink or white with the outer lobes sometimes flushed with red outside. Some unlocalised specimens in Kew Herbarium, collected by Dr. Thom, are almost the same as those of Ross-Frames. They were identified as *I. leucantha* by Baker and N. E. Brown, but compared with Jacquin's figure of *I. leucantha* the plants are shorter and distinctly sturdier with firmer leaves, more acute bracts, a shorter perianth tube and comparatively longer lobes with more distinct veins. Except that the lobes are obtuse instead of acute these specimens match Redouté's figure of *I. candida*, which has generally been assumed to be the same as *I. leucantha* Jacq., but seems rather to be a white-flowered, acute-lobed form of *I. patens*, whereas *I. leucantha* is almost certainly a form of *I. polystachya*.

Var. **linearifolia** Lewis var. nov.

A var. *patenti* ita differt. Folia angustiores lineares: spica densior: tubus perianthii paulo brevior.

Folia linearia, 1·5—2 mm. lata, costata, apicem versus spiraliter torta. *Spica* compacta, dense 5—8-flora. *Flores* rosei vel purpurini, var. *patenti* similes sed tubo perianthii paulo breviore, circa 3 mm. longo, non e bractea exserto; *segmenta* elliptica subobtusa, circa 2 cm. longa, 1 cm. lata.

Differs from var. *patens* in having narrower leaves, the spike more compact and perianth tube slightly shorter.

Leaves linear 1·5—2 mm. wide, costate, spirally twisted towards the apex. *Spike* compact, closely 5—8-flowered. *Flowers* deep pink or purplish, as in var. *patens* but the perianth tube slightly shorter, about 3 mm. long, not exserted from the bract; *lobes* elliptic, subobtuse, about 2 cm. long, 1 cm. wide.

HOLOTYPE. *Thom* in Kew Herbarium.

Flowering period. September.

CALEDON. Villiersdorp, *Loubser* 384 (BOL).

WITHOUT LOCALITY. *Thom* (K).

Dr. Thom's unlocalised collection was named *I. elegans* by N. E. Brown in 1928 (Journ. Linn. Soc. Bot. 48: 43), a new status for *I. aristata* var. *elegans* (Regel) Baker, a variety which Baker based on *Wuerthia elegans* Regel. Brown also identified Thom's plants with sheet b of *Ixia aristata* in Thunberg's herbarium, but after examining these specimens myself I found that I could not agree with these identifications. Sheet b of Thunberg's *I. aristata* is discussed in a note under *I. campanulata* Houtt., and I consider it to be that species, while in my opinion the figure of *Wuerthia elegans* represents a narrow-leafed form of *I. polystachya* L.; the bracts are shown very short, as is usual in that species, and the perianth tube well exserted and more than twice as long as in Thom's plants. In addition, two of the three specimens on Thom's sheet have concolorous flowers whereas the plant figured as *Wuerthia elegans* has pale mauvish pink flowers with a darker circular stain in the middle. These two specimens exactly match a plant collected near Villiersdorp by Mr. Loubser and Miss Barker agrees with me in considering these to be a narrow-leafed variety of *Ixia patens*.

The third specimen on Thom's sheet, on the left side, does not match the other two and is *I. vinacea* Lewis. Its flowers have a dark circular stain in the middle, short filaments with long anthers, and the style reaches to the top of the tube with dark falcate branches spreading at the base of the filaments.

19. **I. conferta** Foster, Contrib. Gray Herb. No. 114: 47. 1936. *I. capitata* var. *ovata* Andr. Bot. Rep. t. 23. 1798. *I. ovata* (Andr.) Sweet, Hort. Brit. 499. 1827. *I. ovata* (Andr.) Klatt, Abh. Naturf. Ges. Halle 12: 396 et Erganz. 62. 1882; Baker, Handbk. Irid. 164. 1892, et Fl. Cap. 6: 82. 1896; Dur. & Schinz, Consp. Fl. Afr. 5: 185. 1895; Marloth, Fl. S. Afr. 4: 146. t. 42 e. 1915.

Corm ovoid or subglobose, 1—1·5 cm. diam.; tunics of coarse somewhat ligneous fibres, vertical below, becoming confluent and more or less reticulate above the middle. *Stem* fairly slender, simple, 15—35 cm. high. *Basal sheaths* 2, 1—5 cm. long, acute or acuminate, usually green towards the apex. *Leaves* 5—6, distichous, lanceolate or occasionally ensiform, 7—24 cm. long, 0·3—1·1 cm. wide, reaching to about the middle of the stem or a little above, suberect to erect or sometimes patent, spirally twisted, firm, several-veined with the mid-rib prominent and narrow cartilaginous margins. *Spike* short, capitate, closely 2—7-flowered, occasionally up to 10. *Bract* obovate, 0·7—1·1 cm. long, acute or with a cusp and 2 short teeth, the lower third opaque, pale, many-veined, the upper part papyraceous, ferruginous or densely streaked with fine reddish brown lines, somewhat lacerated at the apex; *bracteoles* bifid, bicarinate and cuspidate. *Flowers* fairly large, purplish or red with a purple-black circular stain in the middle; *perianth tube* cylindrical, slender, 6—9 mm. long; *lobes* connate for 1—2 mm., oblong or ovate, obtuse, narrowed to the base and sometimes subunguiculate with elliptic interstices between the lobes, 1·3—2·5 cm. long, 0·8—1·7 cm. wide, equal or the outer slightly wider than inner. *Stamens* arising at top of perianth tube, erect, the filaments 3·5—5 mm. long; anthers linear, subsagittate, 7—9 mm. long, purplish. *Ovary* rotund, 3—4 mm. long; style reaching to base of filaments, the branches falcate, linear or oblanceolate, conduplicate, 3—3·5 mm. long, purple, the upper half or more minutely ciliate.

HOLOTYPE. Andrew's Bot. Rep. t. 23.

Sandy flats, usually in damp ground, in the Clanwilliam, Piketberg and Tulbagh Divisions.

Flowering period. August—September.

CLANWILLIAM. Warm Baths, *Edwards* (BOL 14439).

PIKETBERG. Near Piketberg, *Bolus* 13649 (BOL); Porterville, *Roux*, NBG 204/27 (BOL, NBG).

TULBAGH. De Hoek, Saron, *Barker* 5833 (BOL, NBG); *Wilman* 738 (BOL).

This handsome species is allied to *I. maculata* from which it differs in having much harder and more or less woody corm tunics, flowers of a different colour, the filaments free, and the style not reaching above the top of the perianth tube with its branches spreading on the base of the lobes between the filaments. It was figured and described by Andrew in 1798 as a variety of *I. capitata*, a synonym of *I. maculata*, but in 1827 Sweet raised it to specific status and since then all botanists have agreed in regarding it as a distinct species, though it was not until more than a hundred years later that Foster renamed it *I. conferta*. As he explained, "Burmann's name (*I. ovata* Burm. f. = *Geissorrhiza ovata* (Burm. f.) Aschers. & Graebn.) stands as a bar to *I. ovata* (Andr.) Sweet, which is based upon *I. capitata* var. *ovata* Andr. Apparently unaware that Sweet had made this change in status, Klatt made the same change to *I. ovata* (Andr.) Klatt, basing it upon a reference to Andrew's plate".

In the Flora Capensis (Vol. 6, p. 82) Baker placed *I. stellata* (Andr.) Klatt, based on *I. capitata* var. *stellata* Andr. Bot. Rep. t. 232, as a variety of *I. ovata* (Andr.) Klatt, but the plant figured by Andrew has a funnel-shaped perianth tube so belongs in the section *Morphixia*, and is a form of *I. latifolia* De la Roche. On page 78 of the same work Baker cited *I. capitata* var. *stellata* Andr. as a synonym of *I. flexuosa* L.

Var. **ochroleuca** (Ker) Lewis comb. nov. *I. maculata* L. var. *ochroleuca* Ker, Bot. Mag. t. 1285. 1810; Baker, Handbk. Irid. 163. 1892, et Fl. Cap. 6: 81. 1896. *I. ochroleuca* (Ker) G. Don in Sweet Hort. Brit. ed. 2. 502. 1830; Loudon Ladies' Fl. Gard. t. 18. 1841; Klatt, Abh. Naturf. Ges. Halle 12: 397. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 185. 1895; non Vahl. 1806. *I. alboflavens* Eckl. Top. Verz. 27. 1827, *nomen nud. I. lutea* Eckl. l. c. 24, *nomen nud.*

Differs from var. *conferta* in having whitish to sulphur-yellow flowers with a brown to purple-black stain in the middle, and the flowers and plant usually slightly larger.

Corm 1—2·5 cm. diam., as in var. *conferta*. *Stem* 15—50 cm. high, usually 20—30 cm. *Leaves* 4—6, 10—25 cm. long, 0·3—1·5 cm. wide, as in var. *conferta*. *Spike* short, capitate, 3—10-flowered. *Bract* obovate, sometimes carinate, 0·7—1·2 cm. long, cuspidate or with a cusp and 2 rounded lobes or short teeth, pale yellowish white and semipellucid or opaque, several-veined, the upper half sometimes purplish, more often papyraceous, ferruginous and densely speckled or streaked with brown or reddish brown as in var. *conferta*. *Flowers* large or fairly large, cream-coloured or pale yellow (usually sulphur-yellow when dried) with a brown to purplish black stain in the middle; *perianth tube* 0·8—1·2 cm. long; *lobes* 1·7—3 cm. long, 0·9—2 cm. wide, equal, oblong, obovate or suborbicular and shortly and broadly unguiculate or subunguiculate, often with elliptic or rounded interstices at the base. *Androecium* and *gynaecium* as in var. *conferta*, the style branches sometimes up to 5 mm. long.

LECTOTYPE. Botanical Magazine t. 1285.

In clay or gravel soil on flats and hills.

Flowering period. September—October.

CLANWILLIAM. Warm Baths, *Edwards* (BOL 14438).

PIKETBERG. Near Piketberg, *Penther* 603 (M, Z); *Barker* 270 (NBG); *Lewis* (BOL 22248); Berg River, near Piketberg, *Schlechter* 5275 (BOL, BR, G, PRE, Z); between Piketberg and Berg River Bridge, *Barnes* (BOL); between Piketberg Road Station and Piketberg, *Bolus* (BOL 21996); Groenvlei, *Guthrie* 2701 (NBG); Porterville, *Roux*, NBG 203/27 (NBG); near Porterville, *Loubser* 460 (NBG).

TULBAGH. Winterhoek, *Ecklon* 85 (G, SAM); Tulbaghskloof, foot of Winterhoeksberg, Witsenberg and Vogelvallei, *Ecklon* and *Zeyher* (PRE, UPS, *I. lutea* Eckl.).

HOPEFIELD. Near Hopefield, *Bachmann* 1215 (Z).

MALMESBURY. Groenekloof, *MacOwan* 2914, HNAA 941 (BM, BOL, G, K, SAM, UPS); 1 mile N. of Oudepost, near Berg River, *Schlechter* 5275 (BM, BR, K, UPS); *Salter* 4770 (BOL); 1 mile S. of Berg River Bridge, *Salter* 3665 (BM); near Darling, *Bolus* 12842 (BOL, PRE); Malmesbury, *Schlechter* 1622 (BM, G, K, Z); near Paardeberg, *Ecklon* 445 (M, K, PRE, *I. alboflavens* Eckl.); between Malmesbury and Riebeek Kasteel, *Leipoldt* 3028 (BOL, NBG, PRE).

WELLINGTON. Near Huguenot Station, *Lewis* 1608 (SAM).

PAARL. Lange Vallei, Agter Paarl road, *Lewis* 4440 (SAM).

Without Locality. *Thunberg* (G); *Drege* (G); *Marloth* 1753 (PRE).

Except for the different colour of the flowers, and the fact that they are usually slightly larger, there is no character by which this can be distinguished from *I. conferta* and in my opinion it cannot be regarded as more than a distinct colour variety of that species. In the Flora Capensis Baker followed Ker in placing it as a variety of *I. maculata*, but as I have explained in a note under that species, there was complete confusion about the identity of *I. maculata* L. and various other species with a dark circular stain in the middle of the flower were identified as *I. maculata*, or varieties of *I. maculata*, by Thunberg, Jacquin, Ker and other early botanists.

In *I. conferta* var. *ochroleuca* there is considerable variation in the bracts and the flowers, the former varying from pale yellowish white and opaque all over to pale and somewhat pellucid in the lower half and more or less papery and rust-coloured above, and the flowers from cream-coloured with a brown centre and large almost orbicular and distinctly unguiculate lobes with rounded interstices, matching the type figure, to yellowish white with a purple-black centre and more or less oblong subunguiculate lobes. These forms are connected by intermediates.

In the vicinity of Porterville both varieties and hybrids between them were collected by Mr. J. W. Loubser (Nos. 459 and 461 in the Compton Herbarium).

I. alboflavens Eckl. and *I. lutea* Eckl. are almost certainly forms of var. *ochroleuca*, judging from the descriptions of the colours of the flowers and specimens seen which were distributed under these names. In the National Herbarium, Pretoria, there is a plant of *I. odorata* Ker collected in the Clanwilliam Division—Olifants River and at Villa Brakfontein—which was issued as *I. alboflavens* Eckl., but this must be due to some error as the flowers do not agree with Ecklon's description nor was that locality mentioned by him. In a capsule on the sheet there are two flowers of *I. conferta* var. *ochroleuca*, but the remainder are *I. odorata*.

It is possible that *I. nigro-albida* Klatt (Abh. Naturf. Ges. Halle 12: 396. 1882) may be this variety but there is some doubt about it. Klatt gave as a synonym *I. capitata* var. *flore albo, fundo nigro* Andr. Bot. Rep. t. 159, and cited two collections, *Zeyher* 1600 and *Pappe* in Herb. Lubeck. I have not seen either of these and they are presumed to have been destroyed, but there are several collections of *Zeyher* 1600 in Kew, the South African Museum Herbarium and elsewhere and all that have been examined are *I. dubia* Vent. They are not the same as the plant figured by Andrew, which has large white flowers with a very dark, almost black stain, similar to those of some forms of *I. conferta* var. *ochroleuca* except that the lobes are not shown narrowed to the base and unguiculate or subunguiculate. In addition bulbils are shown at the base of the corm, though none have been observed in material from the field, which makes me suspect that Andrew's plant might be a hybrid.

20. **I. versicolor** Lewis sp. nov.

Cormus ovoideus vel subglobosus, 1—1·5 cm. diam., tunicis e fibris fuscis subrobustis compositis. *Caulis* simplex, 15—35 cm. altus. *Folia* 5—6, disticha, linearia vel lineari-lanceolata, spiraliter torta, suberecta vel erecta plerumque ad medium caulis vel interdum apicem versus attingentia, 2—5 mm. lata, firma, nervo medio prominenti et marginibus involutis cartilagineis plus minusve crenulatis. *Spica* brevis, capitata, 3—7-flora. *Bractea* obovata vel ovata, 5—7 mm. longa, carinata, cuspidata, aliquando cuspe et dentibus vel lobis duobus brevibus instructa, pellucida vel caeca, supra medium lilacina, saepe substriata; *bracteolae* bicarinatae bicuspidatae. *Flores* versicolores, albi lobis exterioribus extrinsecus rubido-brunneis vel purpurei vel caeruleo-purpurei, semper ad medium macula fusca notati; *perianthii tubus* e bractea exsertus, filiformis, 0·8—1·2 cm. longus, saepe in basi segmentorum intrusus; *segmenta* per circa 1 mm. connata, subreflexa, oblonga vel obovato-oblonga, obtusa, 1·2—1·7 cm. longa, 6—9 mm. lata. *Stamina* erecta, ad apicem tubi perianthii orta, filamentis circa 2·5 mm. longis et antheris linearibus 5—6 mm. longis. *Ovarium* rotundum, 2—3 mm. longum; stylus ad apicem tubi perianthii attingens, ramis falcatis linearibus conduplicatis 3—4 mm. longis, dimidia parte superiore minute ciliata.

Corm ovoid or subglobose, 1—1·5 cm. diam.; tunics of fairly coarse dark fibres, reticulate above the middle, parallel and vertical below. *Stem* simple, 15—35 cm. high. *Leaves* 5—6, distichous, linear or linear-lanceolate, spirally twisted, suberect to erect, usually reaching to middle of stem but sometimes nearly to the top, 2—5 mm. wide, firm with the midrib prominent and involute cartilaginous more or less crenulate margins. *Spike* short, capitate, 3—7-flowered. *Bract* obovate or ovate, 5—7 mm. long, carinate, cuspidate, occasionally with a cusp and 2 short teeth or lobes, pellucid or opaque, the upper half pale or bright magenta-purple, often faintly striate with a few slightly raised nerves; *bracteoles* bicarinate, bicuspidate. *Flowers* variable in colour, white with the outer lobes dull reddish brown outside, or purple or bluish purple, always with a dark brown or blackish stain in the middle; *perianth tube* exserted from bract, filiform, 0·8—1·2 cm. long, often indented into the base of the lobes; *lobes* connate for about 1 mm., slightly reflexed, oblong or obovate-oblong, obtuse, 1·2—1·7 cm. long, 6—9 mm. wide. *Stamens* erect, arising at top of perianth tube; filaments about 2·5 mm. long; anthers linear, 5—6 mm. long, slightly spreading at the base and connivent at the apex. *Ovary* rotund, 2—3 mm. long; style reaching to top of perianth tube, the branches 3—4 mm. long, falcate, linear, conduplicate, with the upper half minutely ciliate.

HOLOTYPE. *Lewis* in the Bolus Herbarium (No. 21758).

Sandy flats in the Paarl, Stellenbosch and Somerset West Divisions.

Flowering period. October.

PAARL. Simondium, *Stanford* (BOL 26863).

STELLENBOSCH. Kuils River, *Stanford* (BOL 26864, 26866).

SOMERSET WEST. Between Gordons Bay and the Strand, *Lewis* (BOL 21758, 21759); *Parker* 4269 (BOL, K, NBG); Hottentots Holland Mts., *Prior* (K).

WITHOUT LOCALITY. *Drege* (G); *Ecklon* and *Zeyher* 78 (G); *Rogers* (K).

On flats near the coast between Gordons Bay and the Strand plants with mauve and others with white flowers have been found growing together.

This small few-flowered species is near *I. conferta* and *I. dubia*. It has smaller bracts and flowers than the former, with a comparatively longer perianth tube and more spreading, usually slightly reflexed lobes, while from *I. dubia* it differs in having more erect stamens with the anthers connivent at the apex and the style only reaching to the top of the perianth tube with its branches spreading at the base of the filaments. From these and other species it is distinguished by the raised, slightly involute and crenulate leaf margins, and the way in which the perianth tube is often slightly indented into the base of the lobes, a feature which shows most clearly in the buds and has not been observed in any other species. Some of the collections have been identified as *I. columellaris* Ker (= *I. monadelpha*) but it differs in having the filaments free, with the style branches spreading between them at the base.

21. **I. rouxii** Lewis, S. Afr. Gard. 21: 368. 1931.

Corm ovoid, about 1·5 cm. diam.; tunics of fairly coarse fibres, vertical below, becoming confluent and reticulate above the middle. *Stem* firm, moderately slender, 35—55 cm. high, with 1—3 short stiff branches spreading at an angle of 45—90 degrees, the spikes few-flowered, curved up and erect. *Leaves* 4—6, linear or linear-lanceolate, erect, 15—35 cm. long, 2—6 mm. wide, reaching to or above middle of stem, few-veined. *Spike* short, capitate, closely 3—9-flowered. *Bract* ovate or oblong, 5—6 mm. long, acute or shortly cuspidate, sometimes with a short cusp and 2 very short teeth, colourless or with several faint pinkish veins or minutely brown-flecked at the apex; *bracteoles* as long as bract, bicarinate, shortly bicuspidate. *Flowers* white, pink, bluish green or yellow flushed with blue, green or cerise and with a large conspicuous circular stain in the middle covering a third to half its area, usually purple-black; *perianth tube* cylindrical, slender, 5—7 mm. long; *lobes* connate for 1 mm. or less, equal, oblong or obovate-oblong, obtuse, usually shortly unguiculate or subunguiculate, 1·5—2 cm. long, 0·7—1·2 cm. wide. *Stamens* arising at top of perianth tube, the filaments about 5 mm. long; anthers 6—8 mm. long, usually purple-black and somewhat conspicuous, occasionally paler. *Ovary* rotund, about 3 mm. long; style reaching to base of filaments, the branches linear or linear-oblanceolate, conduplicate, 4—5 mm. long, the upper half minutely ciliate.

Holotype. *Roux*, NBG 209/27 in the Bolus Herbarium.

Foot of mountains in the Piketberg and Tulbagh Divisions.

Flowering period. October—November.

PIKETBERG. Porterville, *Roux*, NBG 207/27, 209/27 (BOL, K); *Loubser* 854 (NBG).

TULBAGH. De Hoek Estates, Saron, *Thudichum* (BOL 26917); *Zeyher* (K).

Without Locality. *Thunberg* (UPS—*I. maculata* sheet 6); *Drege* 8366 (S).

A striking character of this species is the way in which the short stiff branches spread at an angle of 45 to 90 degrees from the stem, with the short few-flowered spike curved up and erect. It is closely allied to *I. polystachya*, in which the same stiff type of branching occasionally occurs, but the more or less unguiculate lobes and large conspicuous dark stain generally serve to distinguish it.

22. **I. purpureorosea** Lewis sp. nov.

Cormus subglobosus, 1—1·4 cm. diam., tunicis membranaceis fuscis. *Caulis* subgracilis, simplex, 18—60 cm. altus. *Vaginae basales* 2, subacutae vel acutae, ad 10 cm. longae, interdum apicem versus virides. *Folia* 4—5, disticha, lanceolata, 15—40 cm. longa, 5—9 mm. lata, plerumque prope ad basin spicae attingentia, mollia, multi-nervata, nervo medio solum subprominente. *Spica* dense 3—12-flora, rachide flexuoso interdum declinato et plus minusve horizontali. *Bractea* oblonga, 7—9 mm. longa, cuspidata et lobis vel dentibus duobus instructa, pellucida, alba, interdum apicem versus minute brunneo-punctata; *bracteolae* bifidae bicarinatae cuspidatae. *Flores* purpureo-rosei, tubo et basi segmentorum purpureo-nigro; *perianthii tubus* e bractea exsertus, 0·8—1 cm. longus, gracilis cylindricus apicem versus leviter ampliatus; *segmenta* per circa 2 mm. connata, patentia, oblongo-ovata vel elliptica obtusa, 1·5—2 cm. longa, 7—9 mm. lata. *Stamina* ad apicem tubi perianthii orta, erecta, filamentis 3—4 mm. longis et antheris linearibus subsagittatis luteis 6—8 mm. longis. *Ovarium* rotundum, 3 mm. longum; stylus ad basin vel medium antherarum attingens, ramis albis recurvis linearibus conduplicatis 4—6 mm. longis apicem versus minute ciliatis.

Corm subglobose, 1—1·4 cm. diam.; tunics membranous, dark brown. *Stem* fairly slender, simple, 18—60 cm. high. *Basal sheaths* 2, subacute or acute, up to 10 cm. long, sometimes green at the apex. *Leaves* 4—5, distichous, lanceolate, 15—40 cm. long, 5—9 mm. wide, usually reaching nearly to base of spike, soft in texture, several-veined, with only the midrib slightly prominent. *Spike* closely 3—12-flowered, the rachis flexuose, sometimes declinate and more or less horizontal. *Bract* oblong, 7—9 mm. long, with a cusp and 2 lobes or teeth, pellucid, white, sometimes faintly and minutely spotted with brown at the apex; *bracteoles* bifid, bicarinate and cuspidate. *Flowers* mauve-pink, the tube and base of the lobes purple-black; *perianth tube* exserted from bract, 0·8—1 cm. long, slender, cylindrical, very slightly expanded to the throat; *lobes* connate for about 2 mm., patent, oblong-ovate or elliptic, obtuse, 1·5—2 cm. long, 7—9 mm. wide. *Stamens* arising at top of perianth tube, erect, the filaments 3—4 mm. long; anthers linear, subsagittate, 6—8 mm. long, yellow. *Ovary* rotund, 3 mm. long; style reaching to base or middle of anthers, the branches whitish, recurved, linear, conduplicate, 4—6 mm. long, minutely ciliate towards the apex.

Holotype. *Lewis* 5243 in the Compton Herbarium, Kirstenbosch.

Local in sclerophyll vegetation on the peninsula west of the lagoon at Saldanha Bay.

Flowering period. September—October.

HOPEFIELD. Postberg, Saldanha Bay, *Lewis* 5243 (NBG); *Pillans* 6962 (BOL); *Maguire* 444 (NBG) and *Lewis* (SAM 60709) from Darling Flower Show.

Without Locality. *Van Royen* 103 (L); *Thunberg* (S).

This species, with its slightly funnel-shaped perianth tube, is almost intermediate between the sections *Ixia* and *Morphixia* but its affinity is with the former. It has been confused with *I. conferta* but has much softer, membranous corm tunics, softer leaves, pale bracts and the flowers differ in having the perianth tube very slightly expanded to the throat, narrower lobes which are widest at or below the middle, and the style and style branches longer. It has a very limited distribution and is only recorded from the peninsula west of the lagoon at Saldanha Bay.

The plant figured by Andrew as *I. maculata* var. *minor* in the Bot. Rep., t. 256 (1802), is possibly this species.

23. **I. campanulata** Houtt. Handl. 12: 42. t. 78. f. 4. 1780; Panzer, Pflanzensyst. 11: 49. t. 78. f. 4. 1784; N. E. Br., Kew Bull. 1929, 133; Merrill, Journ. Arn. Arb. 19: 327. 1938. *I. campanulata* Banks ex Roem. & Schultes, Syst. 1: 391. 1817. *I. aristata* Thunb. Diss. Ixia 14. 1783; non Ker 1802 nec Baker 1896. *I. leucantha* Jacq. var. *aristata* (Thunb.) Baker, Fl. Cap. 6: 79. 1896. *I. concolor* Salisb. Prodr. 36. 1796. *I. anemonaeflora* Jacq. Ic. t. 273. 1786—93 et Coll. Suppl. 10. 1796; Baker, Journ. Linn. Soc. Bot. 16: 91. 1877; Dur. & Schinz, Consp. Fl. Afr. 5: 182. 1895; non Red. 1805. *Sparaxis anemonaeflora* Ker in Koenig & Sims Ann. Bot. 1: 225. 1805. *Geissorrhiza anemonaeflora* Klatt, Linnea 34: 357. 1866, pro parte. *Ixia speciosa* Andr. Bot. Rep. 3: t. 186. 1802; Willd. Enum. 1: 56. 1809; Baker, Fl. Cap. 6: 80. *I. crateroides* Ker, Bot. Mag. t. 594. 1802. *I. coccinea* Thunb. Fl. Cap. 241. 1811, pro parte. *Gladiolus coccineus* Schrank, Denkschr. Bot. Ges. Regensb. 2: 197. 1822. *Ixia pulcherrima* Eckl. Top. Verz. 24. 1827, pro parte, *nomen nud. I. candida* Eckl. l. c. 27; non Del. 1814.

Corm ovoid or irregularly subglobose, 1—1·8 cm. diam.; tunics of fine reticulate fibres extending up in a neck 1—2 cm. long. *Stem* 10—35 cm. long, simple, rarely with a long branch arising near the base, straight or flexuose, sometimes curved shortly above the base or near the middle and the upper part subdeclinate. *Leaves* 5—10, linear or subulate, 5—20 cm. long, 2—5 mm. wide, erect or suberect, usually half as long as the stem or slightly more, 3—6-nerved (occasionally 9), the mid-rib and margins slightly prominent. *Spike* short, closely 1—9-flowered, usually 3—6. *Bract* suborbicular, 4—6 mm. long, 5—7 mm. wide, tricuspidate, rarely subtruncate with a single cusp, usually fairly conspicuously 3-nerved and often with several very fine veins, whitish or occasionally magenta-pink; *bracteoles* bicarinate, bicuspidate. *Flowers* rotate-campanulate or crateriform with a very short tube, varying from deep crimson to pure white, usually red with a longitudinal white band on the outside of the lobes or white suffused with red outside; *perianth tube* filiform, 2—3 mm. long, more or less included in the bract; *lobes* connate for 1—2 mm., obovate or obovate-oblong, 1·2—2·5 cm. long, 0·8—1·2 cm. wide. *Stamens* arising at throat of perianth tube, the filaments 3—5 mm. long; anthers linear, 6—8 mm. long. *Ovary* subglobose, 2·5—4 mm. long; style reaching to middle or top of anthers or shortly above them, the branches 3—4 mm. long, linear, conduplicate, minutely ciliate.

HOLOTYPE. *Burmann* in Herb. Delessert, Geneva.

Sandy places at the foot of mountains in the Tulbagh, Paarl and Worcester Divisions...

Flowering period. October—November.

TULBAGH. Near Tulbagh, *Ecklon* 432 (*I. pulcherrima* Eckl.; G, K, M, PRE, S); *Ecklon* 444 (*I. candida* Eckl.; G, K, M, PRE, S); Tulbagh Waterfall, *Ecklon* and *Zeyher* 75 (K); near Tulbagh, *MacOwan* 2480 (K); *Zeyher* (SAM 20912); *Thom* (K); *Pappe* (BM); foot of Winterhoek, *MacOwan* HNAA 265 (BM, BOL, G, K, SAM, UPS); *Wall* (S); foot of Saronberg, *Thudichum*, NBG 2261/36 (BOL, NBG); Saron, *Lewis* (BOL)

WORCESTER. Between Darling Bridge and Worcester, *Bolus* (BOL 26892); Slangheuvel, *Drege* 1558 (P); between Slangheuvel, French Hoek and Donkerhoek, *Drege* (K, S); near Bothashalt Station, *van Breda* 1027 (NBG, PRE); Worcester district, *Cooper* 1671 (K), 1694 (BOL, K, PRE Z).

PAARL. French Hoek Kloof, *Drege* (K).

WITHOUT LOCALITY. *Burmann* (G—type of *I. campanulata*, also plant named *I. flexuosa alba*); *Drege* (BM, G, L); *Lamarck* (P); *Ecklon* and *Zeyher* 266 (G); *Leibold* (G); *Ecklon* and *Zeyher* 82 (G, S); *Martin* (G); *Niven* (BR, G); *Roxburgh* (BM, G); *Thunberg* (UPS—*I. aristata* sheets a, b and c); *Thunberg* (UPS—*I. coccinea* sheet a, also S); *Brehm* (BR, M—*Gladiolus coccineus* Schrank); *Verreaux* (G).

The species is variable as regards the size of the plant, the number of flowers and their colour which varies from deep crimson to pure white with intermediates such as crimson longitudinally banded with white on the outside or white flushed with red on the outside. A few of the forms were considered to belong to different species and some were even placed in other genera. One example of a series of misidentifications concerns the plant with a single large white flower illustrated by Jacquin in his Icones, t. 273, as *I. anemonaeflora.* Ker did not recognise this as an *Ixia* and in 1805 transferred it to the genus *Sparaxis*, probably taking it to be the same as *I. anemonaeflora* Red. Lil. t. 85 (1804), which is a species of *Sparaxis.* In 1866 Klatt transferred *I. anemonaeflora* Jacq. to the genus *Geissorrhiza*, but in 1896 Baker replaced it in *Ixia.* He referred to it in a note under *I. leucantha* as "probably a garden form of this with one very large flower" (Fl. Cap. 6: 79). *I. leucantha* Jacq. is a form of *I. polystachya* L., but two of the collections cited under *I. leucantha* by Baker are in fact the white colour form of *I. campanulata*, i.e. *Ecklon* 444 from near Tulbagh and *Drege* from between Slangheuvel, Frenchhoek and Donkerhoek.

According to N. E. Brown, sheet *a* of *I. aristata* Thunb. is identical with Drege's collection from between Slangheuvel, Frenchhoek and Donkerhoek (Journ. Linn. Soc. Bot. 48: 43. 1928). Of the four sheets named *I. aristata* in Thunberg's Herbarium, Dr. Brown selected the first as the type of *I. aristata*, and considered that each of the others contained a different species. The second he named *I. elegans* (= *Wuerthia elegans* Regel), a new status for *I. aristata* var. *elegans* (Regel) Baker. The third he left unnamed, stating that it did not match any collection in Kew Herbarium, and the fourth was identified by him as *I. micrandra* Baker. The last is correct but I do not agree about the other three and consider that they are all forms of *I. campanulata*, the first a dwarf form, 6—7 inches high with one or two smallish flowers to a plant, the second taller and more robust with a few larger white and red flowers, and the third the same but slightly taller, about two feet high. When I examined Thunberg's specimens in 1949 I noted that at the foot of sheet *a* was written "*campanulata* Houtt.", probably by Linnaeus f. but I cannot be certain about this. Baker, in his Handbook of the Iridaceae and the Flora Capensis, placed *I. aristata* Thunb. as a variety of *I. leucantha* Jacq., and used the name *I. aristata* Ker for a very different species (renamed *I. longituba* by N. E. Brown) which Ker had taken to be the same as Thunberg's.

In Thunberg's Herbarium there are two sheets named by him *I. coccinea*, the first of which is the red colour-form of *I. campanulata* and contains two plants, one only a few inches high, with two flowers, and the other taller with four flowers. The second sheet was correctly identified as *I. patens* Ait. by N. E. Brown.

I. campanulata was figured in 1802 in the Botanical Magazine, t. 594, where it was named *I. crateroides* by Ker, who gave as synonyms *I. speciosa* Andr. and *I. campanulata* Herb. Banks. The following extracts from Ker's description of this species are of interest. The corm he described as being "of a more succulent spongy substance, and not as farinaceous as usual in the genus," and the flowers "of a more substantial consistence than in most species". He added that "out of many hundred specimens both indigenous and from gardens, this is the only one we have ever seen with so many as three flowers, though the species is as liable as its congeners to vary in size of leaf and height of stem".

24. **I. metelerkampiae** L. Bolus, S. Afr. Gard. 19: 27. 1929.

Corm subglobose, 1—2 cm. diam.; tunics somewhat matted, of fine pale reticulate fibres extending up in a neck 2·5—7 cm. long. *Stem* 35—75 cm. high, straight or flexuose, simple or usually divaricately or subdivaricately branched with 1—2 fairly long branches sometimes reaching to about the same level as the terminal spike. *Leaves* 5—9, linear or linear-lanceolate, 10—30 cm. long (average 15—25 cm.), 1—6 mm. wide, usually erect or suberect and reaching to about the middle of the stem, sometimes nearly to the top. *Spike* 5—15-flowered, short and compact but elongating as the flowers mature and finally fairly long and lax with a flexuose rachis. *Bract* suborbicular, truncate or obtuse with a single short cusp or tooth or shortly tridentate, 4—5 mm. long, colourless, pellucid; *bracteoles* bicarinate, bidentate. *Flowers* subrotate-campanulate with a very short tube, pale pink, mauve-pink, bluish mauve or purplish lilac, with a very small purplish red irregular star outlined in white at the centre and a small purplish red spot tapering upwards near the base of each lobe; *perianth tube* filiform, 3—4 mm. long; *lobes* connate for 1—2 mm., equal, obovate or obovate-oblong, 1·4—2·2 cm. long, 0·6—1·2 cm. wide. *Stamens* arising at throat of perianth tube; filaments 4—5 mm. long; anthers 5—6 mm. long, linear, subsagittate. *Ovary* globose or obovoid, 2·5—4 mm. long; style reaching to top of filaments or slightly above, the branches 3—4 mm. long, linear, conduplicate, very slightly expanded and minutely ciliate near the apex.

HOLOTYPE. *Meterlerkamp*, NBG 1707/26 in the Bolus Herbarium.

Lower slopes of mountains in the Paarl, Wellington and Worcester Divisions.

Flowering period. November—December.

WORCESTER. Bains Kloof, *Lewis* 5678 (NBG); *Linley* (SAM 59776); *Schlechter* 9113 (BM, G, K, PRE, Z); Du Toits Kloof, *Barker* 7161 (NBG); *Esterhuysen* 12315 (BOL, PRE), 17766 (PRE); Worcester district, *Cooper* 1611 (K), 1682 (BM, K).

PAARL. Kloof on Suurvlakte, Hawequas Mt., 2,000—3,000 ft., *Esterhuysen* 12315 (BOL, NBG, SAM); near top of Du Toits Kloof, *Lewis* 2288 (SAM); Du Toits Kloof, 2,000—2,500 ft., *Drege* 8368 (G, P), 8376 b (P).

WELLINGTON. *Joubert*, NBG 2632/29 (BOL); Bains Kloof, *Metelerkamp*, NBG 1707/26 (BOL, K); *Grant* 2643 (BOL, PRE); *Worsdell* (K).

WITHOUT LOCALITY. *Drege* 8369 (BM, K, L).

I. metelerkampiae is very closely allied to *I. campanulata* from which it differs in having a longer stem, sometimes more or less divaricately branched, and colourless bracts with inconspicuous cusps and the flowers with different colouring and markings. The plants are often fairly sturdy with the stem somewhat stouter and less flexible than is usual in the genus, and the branches when present are comparatively long, usually reaching to about the same level as the terminal spike. Like most species, however, it is variable and some very slender forms have been seen.

25. **I. vinacea** Lewis sp. nov. *I. maculata* var. Jacq. Hort. Schoenbr. t. 20. 1797.

Cormus globosus, 1·7—2 cm. diam., tunicis e fibris subrobustis parallelis erectis confluentibus supra medium plus minusve connatis, in collo circa 3 cm. longo productis, compositis. *Caulis* gracilis, simplex, 40—45 cm. altus. *Vaginae basales* 2 vel 3. *Folia* 3, 2 inferiora linearia, erecta, firma, 45—60 cm. longa, 2—3 mm. lata, spicam paulo vel bene superantia, supremum brevius, vaginans, lamina libera brevi vel longa. *Spica* brevis, compacta, dense 3—9-flora. *Bractea* obovata vel oblongo-obovata, 5—8 mm. longa, obtusa vel subtruncata cuspe brevi instructa, interdum breviter tridentata, pallide brunneo-alba vel rosea, nervis pluribus leviter prominentibus; *bracteolae* bicarinatae bicuspidatae. *Flores* vinacei ad medium macula caeruleo-purpurea vel nigro-caerulea notati; *perianthii tubus* filiformis, 4—7 mm. longus; *segmenta* per 1 mm. vel minus connata, patentia vel subreflexa, oblonga obtusa, 1·7—2 cm. longa, 0·7—1 cm. lata, interdum basin versus gradatim angustata et subunguiculata. *Stamina* ad apicem tubi perianthii orta, erecta, filamentis purpureo-cyaneis 3·5 mm. longis et antheris fuscis linearibus 7 mm. longis. *Ovarium* rotundum, 3 mm. longum; stylus ad apicem tubi perianthii attingens, ramis linearibus conduplicatis 4 mm. longis, dimidia parte superiore minute ciliata.

Corm globose, 1·7—2 cm. diam.; tunics of fairly coarse vertical parallel fibres, confluent and more or less connate above the middle, extending up in a neck about 3 cm. long. *Stem* slender, simple, 40—45 cm. high. *Basal sheaths* 2 or 3, the lowest colourless, obtuse, enclosed in neck fibres, the second 5—7 cm. long, acute, purplish near the apex, the third 12—14 cm. long, green, acuminate. *Leaves* 3, the 2 lower linear, erect, firm, 45—60 cm. long, 2—3 mm. wide, reaching shortly or well above the spike; third leaf shorter, sheathing with a short or long free blade. *Spike* short, compact, closely 3—9-flowered. *Bract* obovate or oblong-obovate, 5—8 mm. long, obtuse or subtruncate with a short cusp, sometimes shortly tridentate, pale brownish white or pinkish, with several slightly prominent veins; *bracteoles* bicarinate, bicuspidate. *Flowers* wine-red with a bluish purple or blue-black circular stain in the middle; *perianth tube* filiform, 4—7 mm. long; *lobes* connate for 1 mm. or less, patent or slightly reflexed, oblong, obtuse, 1·7—2 cm. long, 0·7—1 cm. wide, sometimes tapering to the base and subunguiculate. *Stamens* arising at top of perianth tube, erect, the filaments dark purple-blue, 3·5 mm. long; anthers dark, linear, 7 mm. long. *Ovary* rotund, 3 mm. long; style reaching to top of perianth tube, the branches linear, conduplicate, 4 mm. long, the upper half minutely ciliate.

HOLOTYPE. *Lewis* 5742 in the Compton Herbarium, Kirstenbosch.

Flats in vicinity of Tulbagh, in clay and stony ground.

Flowering period. August—September.

TULBAGH. *De Klerk*, NBG 1472/22 (BOL); *Pillans* (BOL 18727); *Lewis* 5742 (NBG).

WITHOUT LOCALITY. *Thom* (K).

I. vinacea is distinguished from *I. dubia*, *I. polystachya* and allied species by the corm tunics, which extend up in a fibrous neck, and the fewer and comparatively longer linear leaves which extend above the inflorescence. In the dried state it somewhat resembles *I. gloriosa* but can be distinguished by its simple stem, longer leaves, more compact spike, shorter bracts and the colour of the flowers, also the perianth lobes which are connate for about 2 mm. in *I. gloriosa* and 1 mm. or less in *I. vinacea*.

The striking colour of the flowers makes this one of the most attractive species but it is not a good garden plant owing to the few flowers produced in a short spike, with no branches to prolong the flowering period. It was figured by Jacquin in 1797 as a variety of *I. maculata* and the plants described above match the right-hand figure on plate 20 of his Hortus Schoenbrunniensis. The plant figured on the left on the same plate appears to be either a form of this or a hybrid, with slightly shorter leaves not overtopping the spike, the flowers dark blue with a reddish band outside the deep purplish centre, the lobes narrowed to the base and unguiculate, and shorter style branches.

An unlocalised plant in Kew Herbarium, collected by Dr. Thom, mounted on a sheet with two specimens of *I. patens* var. *linearifolia*, matches the plants described above except that the anthers are yellow instead of dark, but as both yellow and dark anthers are known to occur in other species no great importance is attached to this.

26. **I. gloriosa** Lewis sp. nov.

Cormus ovoideus, 1—1·3 cm. diam., tunicis e fibris tenuibus pallide brunneis reticulatis compositis. *Caulis* gracilis, 35—65 cm. altus, simplex

vel ramis 1—3 erectis gracillimis. *Vaginae basales* 2, 3—13 cm. longae. *Folia* 3—4, 2 vel 3 inferiora linearia erecta, 15—55 cm. longa, 1—3 mm. lata, ad medium caulis vel ulterius attingentia, marginibus et nervo medio subprominentibus, supremum vaginans lamina libera brevi vel longa. *Spica* sat laxe 4—10-flora, rachide subflexuoso. *Bractea* oblonga vel oblongo-ovata, 0·8—1 cm. longa, tricuspidata vel tridentata, pellucida, sine colore vel apicem versus minute brunneo-punctata, interdum nervis purpureis 3 vel 5; *bracteolae* 2-nervatae bicuspidatae. *Flores* sat grandes, rosei ad medium macula purpureo-nigra lucida notati; *perianthii tubus* filiformis, 3—6 mm. longus, in bractea inclusus vel leviter exsertus; *segmenta* per circa 2 mm. connata, basi campanulata, supra patentia, oblonga vel oblongo-ovata obtusa, 1·5—2 cm. longa, 0·7—1·2 cm. lata, subaequalia vel exteriora quam interiora 1—3 mm. latiora. *Stamina* ad apicem tubi perianthii orta, erecta, filamentis 4—5 mm. longis et antheris fuscis linearibus 6—7 mm. longis apicem versus cohaerentibus. *Ovarium* oblongum, 3—4 mm. longum; stylus ad basin vel medium filamentorum attingens, ramis falcatis linearibus conduplicatis 3—3·5 mm. longis, minute ciliatis.

Corm ovoid, 1—1·3 cm. diam.; tunics of fine pale brown reticulate fibres. *Stem* slender, 35—65 cm. high, simple or with 1—3 slender erect branches. *Basal sheaths* 2, 3—13 cm. long, the lower obtuse or acute and upper acute or acuminate. *Leaves* 3—4, the lower 2 or 3 linear, erect, 15—55 cm. long, 1—3 mm. wide, reaching to or above middle of stem, with fairly prominent margins and midrib; upper leaf sheathing with a short or fairly long free blade. *Spike* somewhat laxly 4—10-flowered, the rachis slightly flexuose. *Bract* oblong or oblong-ovate, 0·8—1 cm. long, tricuspidate or tridentate, pellucid, more or less colourless or sometimes minutely brown-spotted at the apex, sometimes with 3 or 5 purplish veins; *bracteoles* 2-veined, bicuspidate. *Flowers* fairly large, deep pink with a shining purple-black circular stain in the middle; *perianth tube* filiform, 3—6 mm. long, included in the bract or very shortly exserted; *lobes* connate for about 2 mm., campanulate at the base, patent above, oblong or oblong-ovate, obtuse, 1·5—2 cm. long, 0·7—1·2 cm. wide, subequal or the outer 1—3 mm. wider than inner. *Stamens* arising at top of perianth tube, erect, the filaments 4—5 mm. long; anthers dark, linear, 6—7 mm. long, connivent at the apex. *Ovary* oblong, 3—4 mm. long; style reaching to base or top of filaments, the branches falcate, linear, conduplicate, 3—3·5 mm. long, minutely ciliate.

HOLOTYPE. *Esterhuysen* 24556 in the Bolus Herbarium.

Low slopes of mountains in the Montagu Division.

Flowering period. August—September.

MONTAGU. Foot of Langeberg near Leeurivierberg, *Esterhuysen*

24556 (BOL); Scheepersrust, 20 miles E. of Montagu, *Martley* (BOL 26930).

This striking and beautiful species resembles *I. conferta* but has much finer corm tunics, fewer and narrower leaves, the stem usually taller and branched with a laxer spike, paler bracts, and the flowers have a shorter tube. The dark stain in the centre of the flower shines as if waxed.

27. **I. vanzijliae** L. Bolus, Ann. Bol. Herb. 4: 114. 1927.

Corm ovoid, 0·8—1·5 cm. diam.; tunics of fine reticulate fibres. *Stem* 18—40 cm. high, slender, simple or with 1 short erect branch near the top. *Basal sheaths* 2—3, 1·5—6 cm. long, the upper half ferruginous, with more or less undulate margins. *Leaves* 5, the 3 basal much shorter than the stem, 4—16 cm. long, 0·4—1·2 cm. wide, somewhat coriaceous, suberect, lanceolate, spirally twisted, with undulate margins; cauline leaves much longer than the basal, up to 25 cm. long, sheathing. *Spike* short, closely 2—7-flowered. *Bract* ovate-lanceolate, 0·9—1·3 cm. long, acute or tridentate, the apex soon becoming torn, the upper half or sometimes the whole closely flecked with fine brown lines; *bracteoles* slightly shorter than bract, bicuspidate. *Flowers* pinkish or pinkish mauve with a small darker mauve circular stain in the middle; *perianth tube* filiform, straight or curved, 0·8—1 cm. long; *lobes* connate for 1—2 mm., obovate-oblong, obtuse, 1·3—2 cm. long, 0·8—1·1 cm. wide. *Stamens* arising at throat of perianth tube; filaments about 3 mm. long; anthers 6—7 mm. long, linear, subsagittate. *Ovary* rotund, 3 mm. long; style reaching to middle of anthers, the branches linear, conduplicate, 2·5 mm. long, minutely ciliate near the apex.

HOLOTYPE. *Van Zijl* in the Bolus Herbarium (No. 18537).

Broken karoo veld in the Swellendam Division.

Flowering period. August—September.

SWELLENDAM. Bonnievale, *Hurling* and *Neil* in Herb. Marloth No. 13709 (BOL, K, PRE).

WITHOUT LOCALITY. *Van Zijl* (BOL 18537); *Ashton* (BOL 17657).

The leaves, with their undulate margins, distinguish this species from all others in the section. It appears to be rare and is known only from the three collections cited above. It was originally described from plants grown in a garden at Claremont, Cape Peninsula, said to have come from the Clanwilliam district, but this must be a mistake as it is fairly certain that this species occurs only in the northern karroid parts of the Swellendam Division.

28. **I. dubia** Vent. Choix. t. 10. 1803; DC. in Red. Lil. t. 64. 1804; Dur. & Schinz, Consp. Fl. Afr. 5: 183. 1895. *I. angustifolia* Eckl. Top. Verz. 25. 1827, *nomen nud. I. maculata* sensu Baker, Handbk. Irid. 163.

1892 et Fl. Cap. 6: 81. 1896, pro parte; Marloth, Fl. S. Afr. 4: 145. t. 42 d. 1915; Lewis in Adamson & Salter Fl. Cap. Pen. 248. 1950; non L. 1762. *Gladiolus umbellatus* Schrank, Denksch. Bot. Ges. Regensb. 2: 202. 1822.

Corm subglobose, 1—1·7 cm. diam.; tunics of moderately firm dark reticulate fibres. *Stem* 20—75 cm. high, usually 30—50 cm., simple or with 1—2 short branches. *Basal sheaths* 2 or 3, 1—8 cm. long. *Leaves* 5—7, linear or linear-lanceolate, 10—50 cm. long, 1·5—8 mm. wide, usually reaching to middle of stem or shortly above but sometimes longer, fairly firm, 3—8-veined with the mid-rib and sometimes also the margins slightly prominent. *Spike* short, capitate, closely 3—15-flowered, the bracts imbricate. *Bract* ovate or ovate-oblong, 5—9 mm. long, carinate, acute or subobtuse with a short cusp, shortly tricuspidate or with a short cusp and 2 short lobes or teeth, pellucid, colourless or pinkish, often striate with several slightly prominent pale veins; *bracteoles* bicarinate, bicuspidate. *Flowers* orange or deep golden-yellow generally with a small dark brown or purplish circular stain in the middle, the outer lobes usually more or less reddish below; *perianth tube* cylindrical, often filiform, 0·6—1·4 cm. long, usually 0·6—1 cm.; *lobes* connate for 1—1·5 mm., oblong or ovate-oblong, obtuse, 1·5—2·2 cm. long, 0·6—1·2 cm. wide. *Stamens* arising at top of perianth tube, the filaments nearly always free but occasionally connate at the base, 3—5 mm. long; anthers linear, 6—8 mm. long, subsagittate. *Ovary* rotund, about 3 mm. long; style usually reaching to middle or top of filaments, the branches linear or oblanceolate, conduplicate, 3—5 mm. long, the upper half minutely ciliate.

LECTOTYPE. Vent. Choix t. 10.

Fairly common on sandy flats, hills, mountain slopes and plateaux up to 3,000 ft. alt., on the Cape Peninsula and in neighbouring districts.

Flowering period. October—December.

PIKETBERG. Bottom of Versvelds Pass, *Pillans* 7126 (BOL).

TULBAGH. *Pappe* (SAM); *Ecklon* 435 (K, M, S); *du Toit*, NBG 939/60 (NBG).

BELLVILLE. Melkbosstrand road, *Barker* 1564 (NBG); between Philadelphia and Melkbosstrand, *Wasserfall* 1016 (PRE); Stikland, *Wall* (S).

CAPE. Doornhoogde, *Zeyher* 1600 (BM, BOL, G, K, PRE, SAM, Z); Cape Flats, *Ecklon* and *Zeyher* 224 (K, SAM), 439 (SAM); Karbonkelberg, *Compton* 15381 (NBG); *Leighton* 312 (BOL); above Bakoven, *Barker* 3216 (BOL, NBG); Camps Bay, *Zeyher* 5037 (BOL, K, PRE), 5036, 5040 (PRE); *Barker* 3199 (NBG); *Lewis* 954 (SAM); *Galpin* 4687 (PRE); *Cassidy* 42 (NBG); between Kloof Nek and Camps Bay, *Lewis* 953 (SAM); Table Mt. near Kasteelpoort, *MacOwan* HNAA 263 (BM, BOL, G, K, SAM, UPS); foot of Table Mt., *MacOwan* 2277 (G, K); *Rogers* 17804 (K);

Mudd 25 (K); *Ecklon* 436 (K, PRE, S, Z—*I. angustifolia* Eckl.); near Cape Town, *Marloth* 344 (PRE); Grootkop, 2,500 ft., *Compton* 19416 (NBG); flats near Rondebosch, *Dod* 382 (BOL, K); *Bolus* 3329 (BOL, Z); *Burchell* 184 (K); Bergvliet, Wynberg and Cape Flats, *Bowie* (BM); Wynberg, *Bolus* 4685 (PRE); *Wallich* (BM): Bergvliet, *Ecklon* and *Zeyher* 86 (SAM); between Constantiaberg and Vlakkenberg, *Salter* 2915 (BOL, K); Steenberg, *Bodkin* 1943 (BM, K); Muizenberg, *Lansdell* (PRE); Muizenberg Mt., near Kalk Bay, *Bolus* 3329 (BM, BOL, K); Chapmans Peak, *Compton* 15442 (NBG): *Lewis* 476, 952 (SAM): Noordhoek, *Barker* 3271 (NBG); Fish Hoek Mt., *Bolus* 7006 (BOL): *Werdermann* and *Oberdieck* 795 (B, PRE); Simonstown, *Salter* 332 11 (BM): *Wall* (S): *MacGillivray* 474 (K); *Prior* (K); *Wright* (K, L); *Meebold* 14897 (M); Schusterskraal, *Compton* 17479 (NBG); Olifantsbosch, *Compton* 23708 (NBG); Klaasjagersberg, *Compton* 17574 (NBG); Brightwater, *Barker* 7174 (NBG).

WELLINGTON. Bains Kloof, *Worsdell* (K).

PAARL. Du Toits Kloof, *Pillans* 8466 (BOL); French Hoek, *Meebold* 14894 (M); *Thode* A 2222 (PRE).

STELLENBOSCH. Mountain slopes, *Garside* 1062 (K): *Worsdell* (K); Jonkershoek, *Garside* 77 (K); Banhoek, *Stanford* (BOL); Blaauklip, *Gillett* 1810 (BOL).

SOMERSET WEST. Sir Lowrys Pass, *Rogers* 26635 (PRE, Z); *Meebold* 14895 (M): slopes of Helderberg, *Pillans* 1232 (BOL): Vergelegen, *Lewis* 5674 (NBG); Gordons Bay, *Werdermann* and *Oberdieck* 133 (B, PRE).

CALEDON. Hermanus, *Rogers* 26596 (PRE, Z): Swartberg, near Baths, *Ecklon* and *Zeyher* (S); Bettys Bay, *Tijmens* (NBG).

WITHOUT LOCALITY. *Ecklon* and *Zeyher* 86 (G, named *I. angustifolia* Eckl.), 88 (B, SAM), 276 (G, S): *Bowie* 388 (G): *Marloth* 8485 (PRE); *Oldenburg* 705 (BM); *Thom* (K); *Forster* (K); *Prior* (BM); *Thunberg* (G); *Royen* (L); *Drege* 8354, 9581 a, b (P); *Jussieu* 3617, partly (P); *Percheron* 88 in Herb. Lamarck (P); *Martin* in Herb. Lamarck 679 (P); *Ecklon* 434 (M, S—*I. flava* Eckl.); *Harvey* 912 (K); *Brehm* (M—*Gladiolus umbellatus* Schrank); *Brehm* 151 (M—*Gladiolus luteus* Schrank).

As the plant from which Ventenat's illustration was drawn has not been seen, and it is not known if it was preserved, his figure is selected as the lectotype.

A form from the foot of the Hottentots Holland Mountains in the Somerset West Division differs from the common form described above in having firmer and more rigid leaves with narrow cartilaginous margins. Its flowers are a deep golden yellow, usually with a small brown stain in the middle and the outer lobes reddish brown outside, the perianth tube is 1—1·5 cm. long and the style reaches to the top of the tube, with branches 4 to 7 mm. long.

I. dubia has generally been confused with *I. maculata* and the majority of specimens in herbaria have been identified as the latter, while some of the descriptions published under the latter name apply partly or entirely to *I. dubia*. The confusion is due to the similarity in the colouring and appearance of the flowers but, as was pointed out by Ventenat when he described the species in 1803, the bracts and bracteoles are different and these, as well as other characters, serve to distinguish the species. The bracts of *I. maculata* are comparatively large, rusty reddish brown in colour and of a papery texture, at least in the upper half, and they tend to shrivel and become torn at the apex, whereas those of *I. dubia* are smaller, firmer in texture, pellucid and colourless or pinkish, usually striate with several slightly prominent pale veins, and they remain unchanged in size or shape into the fruiting stage. The corm tunics of *I. maculata* are usually soft, greyish and submembranous, and slender stolons bearing a cormlet at the apex often arise from the base of the corm; in *I. dubia* the tunics are composed of moderately firm dark reticulate fibres and no stolons have ever been observed. The filaments of *I. maculata* are almost always connate at the base, occasionally to the middle, or in var. *intermedia* to the middle or sometimes to the top, but in *I. dubia*, although they are closely placed and usually connivent at the base, they are rarely connate.

Two specimens of *I. dubia* in Kew Herbarium, collected by Dr. Thom, were compared with Thunberg's specimens of *I. erecta* by Dr. N. E. Brown who observed that they matched Thunberg's plants except that their leaves are not so broad. Thunberg described the flowers as immaculate but one of Dr. Thom's plants has flowers with a dark mark in the centre, though as far as can be seen there is none in the other. The identity of Thunberg's *I. erecta* is discussed in a note under *I. odorata* Ker.

In the Botanische Staatssammlung, Munich, a plant of *I. dubia* collected by Brehm is named *Gladiolus umbellatus* Schrank, and as the plant agrees with Schrank's description the name has been cited above as a synonym of *I. dubia*.

The type of *I. bicolorata* Klatt is no longer in the Berlin—Dahlem Herbarium and is presumed to have been destroyed during the last war. From the description it is possible that it was a small form of *I. dubia* (stem 6 to 12 inches), though there is no mention of a dark mark in the middle of the perianth such as is usually present in this species. In the Flora Capensis Baker reduced *I. bicolorata* to a variety of *I. polystachya* but he did not see the type and did not cite any other collections.

29. **I. maculata** L. (Fig. 4), Sp. Pl. ed. 2, 2: 1664. 1763 et Mant. 2: 320. 1771; Burm. f. Prod. Fl. Cap. 1. 1768, pro parte; Thunb. Diss. Ixia 16.

1783, pro parte; Ait. Hort. Kew. 1: 60. 1789; Baker, Handbk. Irid. 163. 1892 et Fl. Cap. 6: 81. 1896, pro parte; Dur. & Schinz, Consp. Fl. Afr. 5: 184. 1895; Pole Evans, Fl. Pl. S. Afr. 9. t. 329. 1929. *I. milleri* Berg. Pl. Cap. 8. 1767. *I. abbreviata* Houtt. Nat. Hist. 12: 41. t. 78. f. 3. 1780; Panzer, Pflanzensyst. 11: 48. t. 78. f. 3. 1784. *I. conica* Salisb. Prod. 36. 1796; Sims, Bot. Mag. t. 539. 1801; Red. Lil. t. 138. 1807. *I. capitata* Andr. Bot. Rep. t. 50. 1797. *I. duckittiae* L. Bolus, S. Afr. Gard. 21: 281—2. 1931.

Corm globose, 1—1·8 cm. diam.; tunics of soft greyish submembranous reticulate fibres; 1 or 2 slender stolons terminating in a cormlet sometimes arise at the base of the corm. *Stem* 18—50 cm. high, simple. *Basal sheaths* 2, 1—4 cm. long, the lower colourless, obtuse or acute, the upper one half green, acute. *Leaves* 5—8, subulate, linear or lanceolate, 10—35 cm. long, 2—7 mm. wide (occasionally up to 1·2 cm.), reaching to or above the middle of the stem, erect, suberect or the 2—3 basal sometimes more or less patent, moderately firm with several fine veins, usually spirally twisted. *Spike* short, capitate, closely 4—many-flowered, the rachis flexuose. *Bract* ovate or oblong, 0·8—1·5 cm. long, acute or cuspidate, sometimes with 2 short teeth and a cusp, ferruginous and densely streaked all over with fine reddish brown lines or occasionally pale at the base, papyraceous, generally somewhat shrivelled and with the apex lacerated at time of flowering; *bracteoles* bicarinate, bicuspidate. *Flowers* fairly large, orange or yellow-orange with a dark brown, blackish or purplish circular stain at the centre nearly always variegated with a small yellow or orange star-like pattern in the middle, the outer lobes usually more or less red on the outside; *perianth tube* cylindrical, sometimes filiform, 5—8 mm. long, not or only shortly exserted from the bract; *lobes* connate for 1—2 mm., patent, subequal, oblong, obtuse or subacute, 1·5—3 cm. long, 0·8—1·2 cm. wide. *Stamens* arising at throat of perianth tube, the filaments 3—5 mm. long, nearly always connate at the base, occasionally nearly to the middle; anthers linear, 7—9 mm. long, subsagittate diverging above the middle. *Ovary* obovoid or globose, 3—4 mm. long; style reaching from shortly above base to middle of anthers, the branches 3—5 mm. long, linear or sometimes a little expanded towards the apex and subspathulate, conduplicate, falcate, the upper quarter or third minutely ciliate.

LECTOTYPE. Sheet 58·21 in the Linnaean Herbarium.

Sandy flats and hills.

Flowering period. September—October.

CLANWILLIAM. *MacOwan* 2235 (K).

HOPEFIELD. Langebaan, *Lewis*, NBG 2037/32 (BOL, K).

MALMESBURY. Road to Gansekraal, *Kies* 135 (NBG); Darling

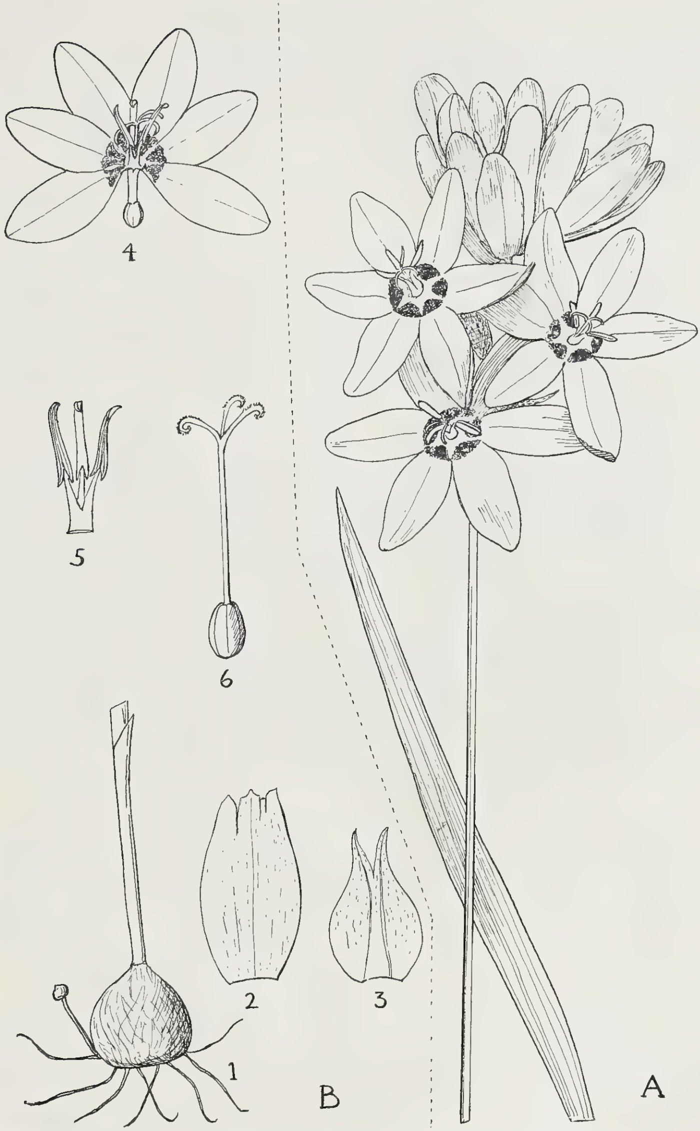


Fig. 4.—*I. maculata.* A. Copied from Bot. Mag. t. 539 (*I. conica* Salisb). B. *Lewis* No. 5746. 1. Corm and base of stem. 2. Bract × 2. 3. Bracteoles × 2. 4. Flower laid open. 5. Stamens × 2. 6. Gynaecium × 2. Del. G. J. Lewis.

Flora Reserve, *Barker* 8645 (NBG); *Lewis* 5746 (NBG); near Darling, *Bolus* (BOL 26919); *Duckitt*, NBG 3202/15 (BOL—type of *I. duckittiae*, K, NBG); *Lewis* 2244 (SAM); *Stokoe* (SAM 65870); near Malmesbury, *Schlechter* 1619 (Z); Groenekloof, *MacOwan* 2277 (SAM); *Zeyher* (PRE, SAM); *Ecklon* and *Zeyher* 265 (G, named *I. vitellina* Eckl.); Mamre hills, *Barker* 1565, 1766, 3837 (NBG).

BELLVILLE. Phesante Kraal, *Compton* 16018 (NBG); *Leighton* 648 (BOL).

CAPE. Near Cape Town, *Rutherford* 221 (BM); Rondebosch, *Drege* (K); *Dod* 373 (BM); Witteboom, *Drege* 311 (P).

WITHOUT LOCALITY. *Burmann* (G); *Linnaeus* (LINN—sheets 58·20 and 58·21); *Thunberg* (G and *I. maculata* sheet 8 in UPS); *Jussieu* 3617, partly (P); *Thom* (K); *Oldenburg* 88 (BM); *Drege* (BM, G, L); *Drege* 8355 (G); *Pappe* (K); *Villett* (K); *Cooper* 3610 (K); *Leibold* (G); *Ecklon* 269 (G, named *I. pallide flava* Eckl.).

The most noteworthy distinguishing characters of this species are the size and texture of the bracts and bracteoles which are larger and more conspicuous than in the majority of species, a rusty reddish brown colour—sometimes pale or greyish at the base—and papery in texture. They tend to become torn at the apex and shrivel instead of retaining their form almost unchanged into the fruiting stage, as is usual in nearly all species of *Ixia*. Another character, of which no mention has previously been made in descriptions although it is shown in the plant figured as *I. conica* in the Botanical Magazine (t. 539), is that the filaments are almost always connate at the base, occasionally nearly to the middle. In living plants the brightly coloured orange flowers with a comparatively small dark brownish or purplish circular stain in the middle, nearly always variegated with a star-like yellow pattern at the base, also serve to distinguish this species.

Linnaeus first published the name *I. maculata* and a brief description of the species in 1763 in the appendix to the second edition of his Species Plantarum, where he indicated that Miller's "*Ixia foliis gladiatis glabris*", Ic. t. 156. f. 1 (1757), and Oldenland's "*Sisyrinchium majus afric. flore luteo macula notato*", both of which he had cited under *I. crocata* (= *Tritonia crocata* (L.) Ker) on p. 52 in the first volume of the same work, should be referred to *I. maculata*. There is no doubt that Miller's figure, in spite of its inaccuracies, represents this species. In the Linnaean Herbarium there are three sheets named *I. maculata*, 58.20, 58.21 and 58.22. On the third are mounted two *Geissorrhiza* plants which do not agree with the description of *Ixia maculata*, and this name was deleted by J. E. Smith. Each of the other two sheets contains a specimen of *I. maculata*, the first without any note on its origin but the second, a weaker plant, is marked

HU (= Horto Upsaliensis), and since Linnaeus must have seen this plant in the living state, and possibly drew his description of the flowers from it, it is selected as the lectotype.

In 1767 Bergius named the species *I. milleri*, citing Miller Ic. t. 156, f. 2, the last an error as it is clear from his description that it should have been fig. 1. During the next thirty years the species was renamed three times, viz. *I. abbreviata* Houtt. (1780), *I. conica* Salisb. (1796) and *I. capitata* Andr. (1797), and in 1931 it was again described as a new species by Dr. L. Bolus, who named it *I. duckittiae*.

Thunberg placed several different species as colour varieties of *I. maculata* and of the nine sheets so named in his herbarium, only three are this species or varieties of it. Jacquin followed Thunberg's conception of *I. maculata* and regarded as varieties various other species in which the flowers have a stain of darker or contrasting colour in the middle. In 1797 he illustrated a number of them in his Hortus Schoenbrunniensis, tt. 19—22, but none of those figured is a variety of *I. maculata*; some are varieties or colour forms of *I. polystachya* but the majority of the flowers figured on plates 21 and 22 are hybrids, a few obviously derived from *I. monadelpha*. Much of the ensuing confusion about the identity of *I. maculata* can be attributed to Thunberg and Jacquin.

In 1801 it was figured on plate 539 of the Botanical Magazine where Sims used Salisbury's name for the species, though he gave as synonyms *I. maculata* L., *I. milleri* Berg., *I. capitata* Andr., and cited Miller's figure. However, that he was in some doubt about the name is clear from the following remarks: "This appears to be a very common plant at the Cape, as every importation of bulbs from there contains a considerable proportion of it, and some arrivals have consisted of little else. Perhaps it may be the plant first described by Linnaeus in the Mantissa, by the name of *I. maculata*, but as that is said to differ from *I. erecta* (i.e. *I. polystachya* L.) only in having a stain at the basis of the corolla, we reserve this name for the species answering best to this description, especially as we cannot trace our plant in any of the thirty-eight varieties of *maculata* figured in Hortus Schoenbrunniensis, among which several distinct species appear to us to have been blended."

Later the name *I. maculata* was generally applied to the species named *I. dubia* by Ventenat in 1803, no doubt due to the similarity in the colouring of the flowers, though in *I. dubia* the dark circular stain in the middle of the flower has no yellow star-like pattern at its base, and it differs also in having smaller bracts and bracteoles of a different colour and texture, and the filaments almost always free.

I. maculata no longer occurs on the Cape Peninsula, though it appears from some of the early records that it must at one time have done so.

Until the beginning of this century it must have been fairly widespread but it is now almost entirely confined to small areas in the Malmesbury Division.

Var. **intermedia** Lewis var. nov. *I. monadelpha* sensu Pole Evans, Fl. Pl. S. Afr. 8: t. 317. 1928; non De la R. 1768.

Var. *maculatae* similis sed ita differt. Bracteae minores obtusiores pallidae vel bicolores: flores plus minusve crateriformes, lobis concavis obtusioribus; filamenta ad medium vel raro ad apicem connata.

Cormus var. *maculatae* similis sed tunicis interdum e fibris subrobustis erectis confluentibus compositis. *Caulis* interdum ad 70 cm. altus, plerumque 20—40 cm. *Folia* var. *maculatae* similia sed plerumque latiora, 0·4—1·4 cm. lata. *Bractea* ovata vel oblongo-ovata, 0·7—1 cm. longa, obtusa, truncata vel interdum acuta vel breviter tridentata, alba vel conspicue bicoloris parte dimidia inferiore alba superne ferruginea, supra medium papyracea. *Flores* plus minusve late crateriformi, aurantiaci vel luteo-aurantiaci ad medium macula brunnea vel purpurea notati, segmentis exterioribus saepe extrinsecus rubidis; *perianthii tubus* 6—8 mm. longus, e bractea non vel breviter exsertus; *segmenta* per 1—2 mm. connata, obovata vel oblonga, obtusa, saepe leviter concava, 1·5—3 cm. longa, 0·9—2 cm. lata. *Filamenta* 4—6 mm. longa, ad medium vel raro ad apicem connata; antherae 0·8—1 cm. longae, diversae vel suberectae. *Gynaecium* var. *maculatae* simile.

Differs from var. *maculata* in having slightly smaller and more obtuse pale or conspicuously bicoloured bracts, the flowers more or less broadly crateriform with wider, more obtuse and concave lobes, and the filaments connate to the middle or occasionally to the top.

Corm as in var. *maculata* but the tunics sometimes of fairly firm vertical confluent fibres. *Stem* sometimes up to 70 cm. high, usually 20—40 cm. *Leaves* as in var. *maculata* but usually wider, 0·4—1·4 cm. wide. *Bract* ovate or oblong-ovate, 0·7—1 cm. long, obtuse, truncate or occasionally acute or shortly tridentate, whitish or conspicuously bicoloured with the lower half whitish and upper ferruginous, papyraceous above the middle. *Flowers* more or less broadly crateriform, orange or yellowish orange with a dark brown or purplish circular stain in the middle, the outer lobes often reddish outside; *perianth tube* 6—8 mm. long, not or only shortly exserted from the bract; *lobes* connate for 1—2 mm., obovate or oblong, obtuse, often slightly concave, 1·5—3 cm. long, 0·9—2 cm. wide. *Filaments* 4—6 mm. long, connate to the middle or occasionally to the top; anthers 0·8—1 cm. long, diverging or suberect. *Gynaecium* as in var. *maculata*.

HOLOTYPE. *Barker* 2591 in the Compton Herbarium, Kirstenbosch.

Sandy soil on flats, hills and mountain slopes in the coastal districts from Vanrhynsdorp to Hopefield.

Flowering period. September—October.

VANRHYNSDORP. *Rood* H 121—26 (K).

CLANWILLIAM. Near Graafwater, *Nouhuys* (PRE 7863); *Zinn* (SAM 59780); Nardouw Kloof, *Stokoe* (SAM 59781); *Barker* 272 (NBG); Pakhuis Pass, *Barker* 1226 (BOL, NBG); Langevalley, *Leighton* (BOL 21468, SAM); Olifants River Valley, *Stephens* 7101 (K); Cold Bokkeveld Mts., foothills opposite Warm Baths, *Stephens* 7104 (K).

PIKETBERG. Antonies River, *Leighton* 105 (BOL); Redlinghuis, *Barker* 2591, 2601 (NBG).

HOPEFIELD. Five miles E. of Hoetjies Bay, *Salter* 3936 (BOL); near Hopefield, *Letty* 70 (PRE); Velddrift, *Grant* 3464 (BOL).

WITHOUT LOCALITY. *Pappe* (K, SAM—*I. fulgens* Pappe MS.); *Villett* (K).

This variety is distinguished from var. *maculata* by its more rounded and slightly smaller bracts which are sometimes whitish all over but more often conspicuously bicoloured, whitish below and rust-coloured above, and by its flowers which are usually broadly bowl-shaped with wider, more rounded and often concave lobes, with the filaments usually connate to the middle, sometimes to the top. The dark circular stain in the middle of the flower rarely has a yellowish star-like pattern at its base. It closely resembles *I. curta* and is somewhat intermediate between that species and *I. maculata*, but distinguished from the former by its corm, which nearly always gives rise to one or more stolons terminating in a cormlet, its different bracts and shorter perianth tube which even in the largest flowers is not more than 8 mm. long and not or only shortly exserted from the bract, and also by its longer and narrower style branches.

In some herbaria this variety has been identified as *I. maculata* (or *I. conica*) and in others as *I. monadelpha*. In Flowering Plants of South Africa, t. 317, it was figured under the latter name, with the bracts shown very short and coloured green and the perianth tube over 1 cm. long and well exserted from the bract, although in the plant from which the plate was prepared the bracts are larger and pallid—possibly pale green at the base in the living state—and the perianth tube is not more than 8 mm. long and only shortly exserted from the bract. The filaments are connate to the top in the flowers figured but in the South African Museum Herbarium there are some plants from the same locality which have their filaments connate to the middle and in the majority the bracts are rust-coloured at the apex.

Klatt cited *I. fulgens* Pappe MS. under *I. ovata* (Andr.) Klatt (= *I. conferta* Foster) but the two unlocalised plants named *I. fulgens* by

Pappe which I have seen are nearer to this variety of *I. maculata*. Flowers from a specimen in the South African Museum Herbarium were dissected and found to have their filaments connate to the middle and the style reaching to the base or middle of the anthers. In appearance these two plants resemble *I. patens* and it is possible that they are of garden origin and perhaps hybrids between that species and *I. maculata* var. *intermedia*.

Var. **fusco-citrina** (Desf. ex DC.) Lewis stat. nov. *I. fusco-citrina* Desf. ex DC. in Red. Lil. t. 86. 1805; Desf. Cat. Hort. Paris.

Distinguished from var. *maculata* by the colour of the flowers and longer perianth tube.

Corm, stem and *leaves* as in var. *maculata* but usually slightly larger and longer, the leaves sometimes up to 2 cm. wide. *Bract* oblong or obovate, obtuse, acute or cuspidate, sometimes with a cusp and 2 short teeth, 0·8—1·3 cm. long, greyish or purplish below and the upper half ferruginous, or pale below, purplish above and papyraceous at the apex. *Flowers* yellow with a dark purplish stain in the middle; *perianth tube* 1—2 cm. long, well exserted from the bract; *lobes* oblong or ovate-oblong, obtuse, 2—3 cm. long, 0·9—1·6 cm. wide. *Filaments* 4—5 mm. long, usually connate at the base; anthers diverging, 0·8—1·1 cm. long. *Gynaecium* as in var. *maculata*.

LECTOTYPE. Red. Lil. t. 86.

Flowering period. September—October.

WITHOUT LOCALITY. *De Candolle* (G); *Lamarck* (P); *Flanagan* 1742 (PRE, Z); *Marloth* 1755 (PRE); *Barker* 271 (NBG, from Ceres Wild Flower Show); *Rogers* (K).

De Candolle's plant in the Delessert Herbarium, Geneva, might be the one from which Redouté's figure was drawn but as I am uncertain about this I have selected the illustration as the lectotype. The date of publication of Desfontain's Catalogue, from which De Candolle adopted the name *fusco-citrina*, has not been ascertained. De Candolle also cited *I. capitata* var. Andr. Bot. Rep. t. 50 but this is the var. *maculata*.

A few plants in the Bolus Herbarium and Kew Herbarium (BOL No. 19885), grown in the garden of Dr. L. Bolus at Claremont, Cape Peninsula, and recorded as coming from Nieuwoudtville in the Calvinia Division, exactly match the type figure except that the flowers are about one third smaller. If this locality is correct it is the only one known for this plant which otherwise is well known in cultivation and is possibly of hybrid origin. The corm is like that of var. *maculata*, with pale greyish submembranous tunics, and gives rise to one or more slender stolons each bearing a cormlet at the end by means of which the plants rapidly multiply. In all other respects it is very near var. *maculata*, being distinguished only by its slightly larger flowers with a longer perianth tube, and the colour of the flowers which in var. *fusco-citrina* are primrose-yellow, sometimes flushed with red outside, the dark purplish stain in the middle having no yellow star-like pattern at its base. The bracts are often purplish in the lower or upper half.

30. **I. curta** Andr. Bot. Rep. t. 564. 1809; Baker, Journ. Linn. Soc. Bot. 16: 92. 1877; Dur. & Schinz, Consp. Fl. Afr. 5: 183. 1895. *I. monadelpha* De la R. var. *curta* (Andr.) Ker, Bot. Mag. t. 1378. 1811. *I. monadelpha* De la R. forma, Baker, Handbk. Irid. 164. 1892 et Fl. Cap. 6: 83. 1896. *I. crocea* Eckl. Top. Verz. 25. 1827, *nomen nud. Morphixia curta* (Andr.) Klatt, Abh. Naturf. Ges. Halle 12: 384 et Erganz. 50. 1882. *Gladiolus luteus* Schrank (? *nomen nudum*); non Lam. 1786.

Corm ovoid or subglobose, 1—1·5 cm. diam.; tunics of fine reticulate fibres. *Stem* 15—40 cm. high, simple or with 1 short more or less patent branch. *Basal sheaths* 2, 1·5—4 cm. long, the lower obtuse or subacute and upper acute. *Leaves* 4—6, lanceolate, moderately firm, several-veined with the margins and midrib slightly prominent, erect, suberect or the 3 lower somewhat patent, sometimes spirally twisted, 8—25 cm. long, 3—6 mm. wide. *Spike* short, compact, 3—8-flowered, the rachis flexuose. *Bract* oblong or ovate-oblong, 0·7—1 cm. long, usually pallid with the upper half flecked or speckled with brown or reddish brown, carinate, nearly always with a short cusp or mucro and 2 short teeth; *bracteoles* bicarinate, bifid, cuspidate or mucronate. *Flowers* fairly large, usually broadly crateriform but the lobes patent when fully expanded in bright sunlight, orange with a brown or greenish brown circular stain in the middle often outlined by a reddish band, the outer lobes often flushed with red outside; *perianth tube* cylindrical, 1—1·5 cm. long, well exserted from the bract; *lobes* connate for 1—2 mm., obovate, obovate-oblong or occasionally ovate, obtuse, 2—2·5 cm. long, 1—1·5 cm. wide, equal or the outer slightly longer and wider than inner. *Stamens* arising at top of perianth tube, the filaments 3—4 mm. long, usually completely connate; anthers linear, erect, 0·9—1 cm. long. *Ovary* ellipsoid or rotund, about 4 mm. long; style reaching shortly above the base or to middle of anthers, the branches spathulate, conduplicate, 2—3 mm. long, with recurved tips projecting between the anthers.

Lectotype. Andrew Bot. Rep. t. 564.

Sandy flats and hill slopes in the Malmesbury and Hopefield Divisions.

Flowering period. October.

HOPEFIELD. Theefontein road, *Bachmann* 1216 (Z).

MALMESBURY. Swartland, *Bachmann* 1218 (Z); Darling Flora Reserve, *Barker* 8660 (NBG); *Lewis* 5084 (NBG); between Malmesbury and Moorreesburg, *Pillans* (BOL); Darling, *Ross-Frames*, NBG 1403/26

(BOL); Groenekloof, *Ecklon* and *Zeyher* (PRE—named *I. vitellina* Eckl.); Kalabaskraal, *Werdermann* and *Oberdieck* 320 (B, PRE).

WITHOUT LOCALITY. *Ecklon* 433 (M, K, PRE—named *I. crocea* Eckl.); *Brehm* (BR—? type of *Gladiolus luteus* Schrank).

This has been variously treated as a distinct species or a variety or form of *I. monadelpha* by Andrew, Ker, Klatt, Baker and others. In his Systema Iridacearum Baker treated it as a species and, on account of its united filaments, placed it with *I. monadelpha* in a separate subgenus, *Eurydice* (Journ. Linn. Soc. Bot. 16: 92. 1877), but in the Flora Capensis he listed it as one of several named forms of *I. monadelpha*. It is undoubtedly closely allied to *I. monadelpha* but I have followed those botanists who regarded it as distinct since the following differences seem to warrant this: (i) The corm tunics of *I. curta* are composed of moderately fine blackish reticulate fibres, and those of *I. monadelpha* are greyish, soft and more or less papyraceous. (ii) The plants in both species are about the same height but the stem is nearly always simple in *I. curta* and generally branched in *I. monadelpha*. Andrew's figure of *I. curta* represents an unusually stunted plant. (iii) The flowers of *I. curta* are larger and usually broadly crateriform (except in bright sunshine at mid-day), with a somewhat stouter perianth tube and considerably broader lobes.

Klatt cited *Gladiolus luteus* Schrank as a synonym of *Morphixia curta* (Andr.) Klatt, but this name is not listed in the Kew Index and I have not been able to ascertain whether it was ever published or if it is merely a MS name. In the herbarium of the Botanical Gardens, Brussels, there is a specimen of *Ixia curta* named *Gladiolus luteus* Schrank, collected by Brehm, and in the Botanische Staatssammlung, Munich, a specimen of *I. dubia*, also collected by Brehm, No. 151, is named *Gladiolus luteus* Schrank.

Some of the plants distributed as *Ixia vitellina* Eckl., a *nomen nudum*, are *I. curta* and others *I. maculata*, which it closely resembles in the dried state.

31. **I. monadelpha** De la R. Desc. Pl. Nov. 22. 1766; Ker, Bot. Mag. t. 607. 1802 et Gen. Irid. 101. 1827; Baker, Journ. Linn. Soc. Bot. 16: 92. 1877, Handbk. Irid. 164. 1892 et Fl. Cap. 6: 82. 1896; Dur. & Schinz, Consp. Fl. Afr. 5: 185. 1895; Lewis in Adamson & Salter, Fl. Cap. Pen. 249. 1950. *I. monadelphia* Burm. f. Fl. Cap. Prod. 1. 1768. *I. cartilaginea* Lam. Encyc. 3: 340. 1789 et Illustr. 1: 112. 1791. *I. columnaris* Salisb. Prod. 36. 1796. *I. columnaris* var. *grandiflora* Andr. Bot. Rep. t. 250. 1802. *I. grandiflora* (Andr.) Pers. Syn. 1: 48. 1805; Klatt ex Dur. & Schinz, l. c. 184. *I. columnaris* var. *latifolia* Andr. l. c. t. 213; *I. columnaris* var. *purpurea* Andr. l. c. t. 203. *I. purpurea* (Andr.) Klatt ex Dur. & Schinz,

l. c. 186. *I. columnaris* var. *angustifolia* Andr. l. c. t. 392. *I. angustifolia* (Andr.) Klatt ex Dur. & Schinz, l. c. 182; non Eckl. 1827. *I. columellaris* Ker, Bot. Mag. t. 630. 1803; Baker, Handbk. Irid. 163 et Fl. Cap. 6: 81; Dur. & Schinz, l. c. 183. *I. columellaris* var. *rhodolarynx* Baker, Journ. Linn. Soc. Bot. 16: 91. *I. variegata* Banks ex Schult. Mant. 1: 328. 1822, *nomen nud. I. galaxioides* Klatt ex Dur. & Schinz, l. c. 184. *Galaxia ixiaeflora* Red. Lil. t. 41. 1802 (*G. ramosa* in textu). *Morphixia grandiflora* (Andr.) Klatt, Abh. Naturf. Ges. Halle 12: 383 et Erganz. 49. 1882. *M. latifolia* (Andr.) Klatt, l c. 385 et 51. *M. purpurea* (Andr.) Klatt, l. c. 383 et 49. *M. angustifolia* (Andr.) Klatt, l. c. 384 et 50. *M. columellaris* (Ker) Klatt, l. c. 384 et 50.

Corm globose or depressed-globose, 1·3—2 cm. diam.; tunics soft, greyish, somewhat papyraceous. *Stem* 15—40 cm. high, firm, often moderately stout, usually with 1 or 2 short patent curved branches. *Basal sheaths* 2, acute, 1·8—8 cm. long. *Leaves* 4—7, the 3 or 4 basal patent to suberect, lanceolate or ensiform, 8—28 cm. long, 0·3—1 cm. wide, usually spirally twisted, firm, several-veined, sometimes with narrow cartilaginous margins. *Spike* short, closely 4—12-flowered, the rachis usually flexuose. *Bract* oblong or obovate-oblong, 0·5—1 cm. long, nearly always opaque, pale below and minutely flecked or spotted with reddish or dark brown towards the apex, carinate, acute, truncate or more often with a somewhat conspicuous short to fairly long dark cusp or mucro and 2 short teeth; *bracteoles* bicuspidate or with dark more or less recurved mucros. *Flowers* variable in colour, pale or dark blue, violet, mauve, purplish, pale pink or white, all with a circular stain in the middle nearly always outlined with a band of another colour, the middle usually green, brown or dull reddish brown and the outer band often brownish; *perianth tube* cylindrical, slender, 1—1·8 cm. long; *lobes* connate for 1—1·5 mm., patent, equal, oblong, obtuse, 1·3—2 cm. long, 0·6—1·1 cm. wide, about as long as the tube or slightly shorter or longer, occasionally obovate or obovate-oblong and up to 1½ times as long as the tube. *Stamens* arising at top of perianth tube, the filaments 3—6 mm. long, nearly always connate to the middle or top; anthers linear, 7—8 mm. long, more or less connivent. *Ovary* rotund, about 3 mm. long; style reaching to shortly above the base or middle of anthers, occasionally nearly to the top, the branches spathulate or subspathulate, conduplicate, minutely ciliate, 2—3 mm. long, with recurved tips projecting between the anthers.

HOLOTYPE. *Burmann* in Herb. Delessert, Geneva.

Flats and hill slopes in sandy ground or marshy vleis.

Flowering period. September—December.

TULBAGH. *Pappe* (SAM 20928); ? *Zeyher* (K).

MALMESBURY. Darling Flower Show, *Maguire* 446 (NBG); Darling, *van Breda* 1053 (NBG, PRE).

BELLVILLE. Tygerberg, *Prior* (K).

CAPE. Near Riet Vlei, *Zeyher* 1601 (G, K); Salt River, *Zeyher* 4667 (BOL); *Pappe* (BM); near Hout Bay, *MacOwan* 2481 (K, SAM); *MacOwan* HNAA 266 (BM, G, K, UPS); near Camps Bay, *Dod* 1785 (BM, BOL); *Zeyher* (BOL); *Pappe* (BM, K); between Clifton and Camps Bay, *Goulinis* (BOL 26870); Green Point, *Pappe* (SAM 20927); Rondebosch Common (Camp Ground), *Zeyher* 5039 (BOL); *Salter* 9005 (BOL); *Bolus* 4899 (BOL); *Compton* 16578 (NBG); *L. Bolus* (BOL 20996, K, PRE).

WITHOUT LOCALITY. *Burmann* (G); *Thunberg* (UPS, *I. maculata* sheet 9); *Zeyher* 436 (BOL); *Ecklon* and *Zeyher* (PRE, Z); *Lamarck* (P—type of *I. cartilaginea* and specimens named *I. monadelpha*); *Oldenburg* 62, 699 (BM); *Drege* 8363 (S), 8373 (BM, K, L, P); *Villett* (K); *Forster* (K); *Gill* (K); *Mund* (K); *Brehm* (M); *Hahn* (Z); *De Candolle* (G); *Moricand* (G).

This species is probably the most variable in the genus, with many different colour forms. One of its distinguishing characters is the way in which the stamens are arranged in an erect column with the filaments almost always united to the middle or the top and anthers more or less connivent with the tips of the short style branches projecting between them. When these organs are concealed in herbarium specimens it is very often possible to recognize the species by its bracts and bracteoles which are generally spotted or streaked with dark brown at the apex and frequently have somewhat conspicuous cusps or mucros.

Four or five colour forms of this species, figured by Andrew as varieties of *I. columnaris*, a synonym of *I. monadelpha*, were later raised to specific status by Klatt who placed them in the genus *Morphixia*. One of them, *M. versicolor* (Andr.) Klatt (= *Ixia columnaris* var. *versicolor* Andr. Bot. Rep. t. 211) is possibly a hybrid with *I. curta* Andr., which it resembles in having orange-yellow flowers partly reddish brown outside and inside a large dark brown or blackish circle in the middle with radiating red lines, but the lobes are much narrower and are patent, as in *I. monadelpha*. A few of the flowers figured as varieties of *I. maculata* by Jacquin in his Hortus Schoenbrunniensis, tt. 21 and 22, are undoubtedly hybrids of *I. monadelpha*; in some of them the stamens are depicted in an upright column with the tips of the style branches just showing between the anthers.

Ker distinguished *I. columellaris*, Botanical Magazine t. 630, from *I. monadelpha* by its filaments not being connate beyond the base (which occasionally happens in *I. monadelpha*), by the way in which the flowers expand, and its having fragrant flowers and a different flowering time, but for all this I think it is no more than a form of the very variable *I. monadelpha*.

In the Flora Capensis Baker cited *Ixia cartilaginea* Lam. in the synonymy under *Watsonia marginata* (Vol. 6, p. 104), a mistake which he could not have made had he seen the type in Lamarck's herbarium in Paris. The specimen named *Ixia cartilaginea* is a poor one, with only the remains of one flower, but the plant is obviously an *Ixia* and from its appearance and Lamarck's description there is little doubt that it is *I. monadelpha*.

The section *Eurydice* of Persoon, or subgenus *Eurydice* (Pers.) Baker, distinguished by the connate filaments, is not upheld as this character has been found to be unreliable and no great importance can be attached to it. In *I. monadelpha*, the only species placed in the subgenus by Baker, the filaments are nearly always partly to entirely connate, but in *I. maculata* and its varieties they vary from free to partly or sometimes entirely connate, and in *I. dubia* they are occasionally connate at the base.

SECTION **HYALIS**

(Salisb. ex Baker) Diels in Engl. & Prantl Pflanzemfam. ed. 2. 15 a: 486. 1930. *Hyalis* Salisb. Trans. Hort. Soc. 1: 317. 1812, pro gen., nomen nudum. *Ixia* subgenus *Hyalis* Salisb. ex Baker, Handbk. Irid. 161. 1892 et Fl. Cap. 6: 77. 1896. *Houttuynia* Houtt. Nat. Hist. 12: 448. 1780, pro gen., nom. rejic.; non Thunb. 1784, nom. cons. *Freesea* Eckl. Top Verz. 30. 1827, pro gen., nomen nudum.

Perianth tube 2 cm. or more long, slender, subcylindrical, slightly and gradually expanded from base to throat or in the upper third, usually distinctly longer than the lobes; stamens arising shortly or well below top of tube, included in the tube or exserted.

(Exception: In southern form of *I. longituba* the perianth tube is shorter, 1·2—1·8 cm. long, sometimes slightly shorter than the lobes).

Type species: *I. paniculata* De la R.

32. **I. paniculata** De la R. Descr. Pl. Nov. 26. t. 1. 1766; Baker, Handbk. Irid. 166. 1892 et Fl. Cap. 6: 85. 1896. *Morphixia paniculata* (De la R.) Baker, Journ. Linn. Soc. Bot. 16: 97. 1877. *Tritonia paniculata* (De la R.) Klatt, Abh. Naturf. Ges. Halle 12: 358 et Erganz. 24. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 206. 1895. *Ixia longiflora* Berg. Descr. Pl. Cap. 7 et 360. 1767; Lam. Encyc. 3: 342. 1789 et Illustr. 1: 112. 1791 (excl. ref. Mill. Ic.); Ait. Hort. Kew. 1: 58 (excl. syn. *Gladiolus longiflorus* L.f.); Curtis, Bot. Mag. t. 256. 1794 (excl. syn. *G. longiflorus* L.f.); Red. Lil. t. 34. 1803. *Gladiolus longiflorus* var. Jacq. Ic. t. 263. 1786—93 et

G. longiflorus Jacq. Coll. Suppl. 23. t. 7. f. 1. 1796; non L.f. 1781. *Hyalis longiflora* Salisb. Trans. Hort. Soc. 1: 318. 1812 (excl. syn. *Gladiolus longiflorus* L.f.), *nomen nudum. Tritonia longiflora* Ker in Koenig & Sims Ann. Bot. 1: 222. 1805 et Bot. Mag. t. 1502. 1812. *Freesea longiflora* Eckl. Top. Verz. 30. 1827, *nom. nud. Houttuynia capensis* Houtt. Nat. Hist. 12: 448. t. 85. f. 3. 1780; Panzer, Pflanzensyst. 11: 523. t. 85. f. 3. 1784. *Gladiolus ixioides* Thunb. Fl. Cap. 208. 1811. *Ixia longiflora* var. b. Willd. Sp. Pl. 1: 203. 1797. *I. tenuiflora* Vahl, Enum. 2: 66. 1806. *Tritonia tenuiflora* (Vahl) Ker, Bot. Mag. sub t. 1275. 1810; Lodd. Bot. Cab. t. 1078. 1825; Klatt, Abh. Naturf. Ges. Halle 12: 358 et Erganz. 24; Dur. & Schinz, l. c. 208. *Morphixia paniculata* (De la R.) Baker var. *tenuiflora* (Vahl) Baker, Journ. Linn. Soc. Bot. 16: 97. *Ixia paniculata* De la R. var. *tenuiflora* (Vahl) Baker, Handbk. Irid. 166 et Fl. Cap. 6: 85. *Tritonia concolor* Sweet Brit. Fl. Gard. 398. 1827 et ed. 2. 502. 1830. *Waitzia concolor* Heyn. Nom. 1: 854. 1840, *nom. illeg. W. longiflora* Heyn. l. c., *nom. illeg. W. tenuiflora* Heyn. l. c., *nom. illeg.*

Corm globose, 1—1·5 cm. diam.; tunics pale brown, soft and somewhat membranous. *Stem* 30 cm. to 1 m. high, the lower half sometimes fairly stout, usually with 1 or 2 patent or suberect branches. *Leaves* erect or suberect, linear to lanceolate, moderately firm, 15—60 cm. long, 0·3—1·2 cm. wide. *Spike* 4—14 cm. long, fairly laxly to closely 5—18-flowered, the flowers erect or suberect. *Bract* oblong or lanceolate, acute or shortly cuspidate, 0·8—1·5 cm. long, soft and sometimes lacerated at the apex, pale brown or pallid, the lower half usually subhyaline; *bracteoles* bicarinate, bicuspidate or bidentate. *Flowers* pale or deep cream, occasionally yellowish, the outer lobes often partly pink or reddish outside and sometimes also the throat of the tube; *perianth tube* slightly and gradually expanded from base to throat, 4—7 cm. long, 3—5 mm. diam. at the throat; *lobes* less than half as long as tube, oblong or linear-oblong, obtuse or subemarginate, 1·5—2·5 cm. long, 3—8 mm. wide, equal or the outer sometimes larger than inner. *Stamens* arising in the perianth tube, the filaments shortly decurrent, 5—6 mm. long, not exserted; anthers 6—8 mm. long, linear, sagittate, usually purplish, varying from almost entirely included in the tube to almost entirely exserted. *Ovary* rotund, 3—4 mm. long; style sometimes directed to one side of stamens, reaching to base middle or top of anthers or sometimes extending well above them, the branches 1·5—2 mm. long, spathulate, conduplicate, recurved at the apex.

Lectotype. De la Roche Descr. t. 1.

Flats and plateaux from the Clanwilliam Division to the Cape and Caledon Divisions, usually in marshy ground.

Flowering period. September—December.

CLANWILLIAM. *Le Roux* (BOL 21809); Brakfontein, *Rabinowitz*

(SAM 68440); between Citrusdal and Clanwilliam, *Thorne* (SAM 49907); Citrusdal, *van Zyl*, NBG 619/27 (NBG); Brandewyn Rivier, *Middlemost* 1896 (NBG); Pakhuis Pass, *Thode* A 2139 (K, PRE); Pikeniers Pass, *Pearson* 5205 (K).

PIKETBERG. St. Helenafontein, *L. Bolus* (BOL 22298, SAM); between Bergvalei and Langevalei, *Drege* (K); Bergvalei, *Drege* 1563 (P).

HOPEFIELD. *Pattison* (BOL 13674); *Bachmann* 1220 (Z).

MALMESBURY. Near Bok Point, *Barker* 1225 (NBG); between Darling and Bokbaai, *Esterhuysen* 4376 (NBG, PRE); *Thomas* (NBG); Groenekloof, *Zeyher* 1620 (BM, BOL, G, K, PRE, SAM); "Blijdskap", *Pillans* 1225 (BOL).

BELVILLE. Between Tygerberg and Paardeberg, *Pappe* (SAM 20943).

CAPE. Rietvlei, *Zeyher* (SAM 20944); Camps Bay, *Dod* 1785 (K); near Cape Town, *Bolus*, HNAA 476 (BM, BOL, G, K, SAM, UPS, Z); Table Mt., 3,000 ft., *Bolus s. n.* (NBG, PRE, S); Rondebosch, *Dod* 381 (BM, BOL); Kenilworth Race Course, *Salter* 8704 (NBG); Wynberg, *Bolus* 4513 (BM, BOL, Z); Princess Vlei, *MacOwan* 3159 (SAM); near Retreat Station, *Salter* 4006 (K); Kommetjie, *Hayter* (PRE); Schusters Kraal (Scarborough), *Compton* 5971 (NBG); *Linley* (SAM 56069); Buffels Bay, *Compton* 6386 (NBG); *Salter* 1870 (BOL); Redhill, *Jameson* (K); Witsands, *Werdermann* and *Oberdieck* 817 (B, PRE).

CALEDON. *Marloth* 5939 (PRE); Hangklip Estate, *Porter* (BOL 26897).

WITHOUT LOCALITY. *Burchell* (K); *Niven* 22 (BM); *Wallich* (BM); *Drege* (BM, G); *Ecklon* 281 (G); *Jussieu* 3625 (P); *Lamarck* (P); *Brehm* (BR) *Ecklon* and *Zeyher* (Z); *Thunberg* (G, S); *Sieber* (G); *Verreaux* (G); *Ventenat* (G); *Thunberg* (UPS—type of *Gladiolus ixioides*).

This species is fairly widespread and very variable, with three or four distinct forms which merge into one another. Three forms are illustrated on one plate in the Botanical Magazine, t. 1502, where they are named *Tritonia longiflora* by Ker. The large figure in the centre represents the northern form, found in the Clanwilliam and Piketberg Divisions, and this same form was figured by Jacquin as *Gladiolus longiflorus* var. (Ic. t. 263). It has a slightly longer and laxer spike and narrower perianth lobes than the southern form, but intermediates between these two occur in the Piketberg and Hopefield Divisions. The short-tubed form, named *Ixia tenuiflora* by Vahl and treated as a variety of *I. paniculata* by Baker, is also variable and as it has been found growing together with the typical long-tubed southern form as illustrated on plate 256 of the Botanical Magazine, I do not consider that it can be upheld as a variety. The difference in the length of the style is shown in the three forms figured on plate 1502 of the Botanical Magazine, where it can be seen to vary from well exserted to completely included in the perianth tube. In 1827 one of these forms was named *Tritonia concolor* by Sweet.

The species was originally described and figured as *Ixia paniculata* by De la Roche in 1766 and in the 190 odd years since then it has been renamed more than once and transferred from one genus to another by various authors. In 1767 it was named *I. longiflora* by Bergius and his specific epithet was used by most of the authors who subsequently transferred the species to other genera.

In 1780 it was figured and described as *Houttuynia capensis* by Houttuyn, but his figure was misinterpreted by Ker who identified it with the plant he illustrated and described as *Tritonia capensis* in the Botanical Magazine, t. 618, in 1803. More than a hundred years elapsed before this mistake was recognized and pointed out by Merrill (Journ. Arn. Arb. 19: 327. 1938—see historical note at beginning of this paper).

The plant figured as *Gladiolus longiflorus* var. by Jacquin on plate 263 of his Icones represents one of the forms of *Ixia paniculata*, but the plant named *Gladiolus longiflorus* by Linnaeus f. and Thunberg, which they assumed to be the same as *Ixia longiflora* Berg., is not this species. N. E. Brown pointed out this mistake in 1928 after examining the South African Iridaceae in Thunberg's herbarium (Journ. Linn. Soc. Bot. 48: 24), and correctly identified Thunberg's plant with a species of *Tritonia*. In 1811 Thunberg described a specimen of *Ixia paniculata* in his herbarium as *Gladiolus ixioides*, believing it to be an unnamed species.

Ixia paniculata was figured as *I. longiflora* on plate 256 of the Botanical Magazine, but three years later Ker transferred it to *Tritonia* as *T. longiflora*, and in 1812 figured the three forms mentioned above on plate 1502 of the Botanical Magazine.

In 1812 Salisbury published the generic name *Hyalis* in the Transactions of the Horticultural Society (Vol. 1, p. 318), in association with four species of *Ixia*, but as he gave no generic characters *Hyalis* is a *nomen nudum*. One of the combinations he made was *H. longiflora*, for which he cited as synonyms *Ixia longiflora* Curt. Bot. Mag. t. 256 and *Gladiolus longiflorus* L. f. Suppl. 96, but as explained above, these are not the same.

Freesea Eckl., published in 1827, is another *nomen nudum*. Of the five species associated with the name by Ecklon, four belong to the genus *Tritonia* but one, *Freesea longiflora* Eckl. (syn. *Tritonia longiflora* Ker), is *Ixia paniculata*.

The generic name *Waitzia*, published by Reichenbach in 1828 (Consp. 60) is illegitimate as the name had already been used ten years earlier by Wendland for a genus of Compositae. In 1840 Heynbold made several illegitimate new combinations with *Waitzia* Reichb., among them *W. concolor*, *W. longiflora* and *W. tenuiflora*, based on *Tritonia concolor*, *T. longiflora* and *T. tenuiflora,* all of which, as mentioned above, are synonyms of *Ixia paniculata.*

33. **I. splendida** Lewis, Journ. S. Afr. Bot. 4: 9. 1938.

Corm subglobose, about 1·5 cm. diam.; tunics of fine reticulate fibres, sometimes extending up in a neck 0·5—1·5 cm. long. *Stem* slender, simple, 30—60 cm. high. *Basal sheaths* 3, the lowest acute and others acuminate, 3·5—11 cm. long. *Leaves* 4—5, erect, reaching a little above middle of stem, the 3 basal linear, 18—45 cm. long, 2—3 mm. wide, with slightly prominent margins and mid-rib, the 1 or 2 cauline almost entirely sheathing. *Spike* short, capitate, closely 5—7-flowered. *Bract* oblong, 7—8 mm. long, obtuse or subtruncate with a small cusp, or shortly and unequally tridentate, thin, 1—7-veined, the lower half more or less pellucid and upper minutely flecked with brown; *bracteoles* bicarinate, bicuspidate. *Flowers* erect, pale pink; *perianth tube* 2·2—2·8 cm. long, slightly and gradually expanded from base to throat, 3—5 mm. diam. at the throat; *lobes* equal, oblong, obtuse or subemarginate, 1·5—1·8 cm. long, 6—8 mm. wide. *Stamens* arising in perianth tube, included or occasionally the tips of the anthers exserted; filaments 4—5 mm. long; anthers 5—6 mm. long, subsagittate. *Ovary* subglobose, 2—3 mm. long; style reaching to base or middle of anthers, the branches about 1·5 mm. long, filiform, conduplicate, slightly expanded and minutely ciliate towards the apex.

HOLOTYPE. *Pillans* 7183 in the Bolus Herbarium.

Flowering period. October—November.

PIKETBERG. Zebra Kop, near stream, *Pillans* 7183 (BOL, PRE, SAM).

This attractive species, with delicate rose-pink flowers, is nearest *I. paniculata,* from which it differs in having an unbranched stem, shorter perianth tube and the anthers included in the tube. It appears to be local on the Piketberg Mts. and is known only from the one locality recorded above.

34. **I. paucifolia** Lewis, S. Afr. Gard. 23: 213. 1933. *I. bolusii* Lewis, Journ. S. Afr. Bot. 4: 10. 1938.

Corm ovoid or subglobose, 1—2·8 cm. diam.; tunics of fine or fairly coarse reticulate fibres. *Stem* 12—55 cm. high, usually 15—30 cm., slender, simple or with 1 or 2 short patent or suberect branches. *Basal sheaths* 2, 2—7 cm. long, the lower colourless, obtuse, and upper acute usually with the upper half ferruginous. *Leaves* 3 (rarely 2), the basal lanceolate or linear-lanceolate, 8—30 cm. long, 0·3—1 cm. wide, somewhat coriaceous with the mid-rib prominent and narrow cartilaginous margins, the lower sometimes falcate and second more or less erect: third leaf entirely sheathing. *Spike* short, closely 3—11-flowered. *Bract* ovate-oblong or oblong, 6—9 mm. long, acute, cuspidate, sometimes with 2 short teeth, tridentate or occasionally truncate, pellucid, conspicuously 3-veined, sometimes minutely flecked with brown near the apex; *bracteoles* bicarinate, bicuspidate. *Flowers* erect, white or cream-coloured with the outer lobes sometimes mauve outside, occasionally pale or deep pink; *perianth tube* 2·2—3·5 cm. long, filiform at the base, gradually expanded upwards and 1·5—3 mm. diam. at the throat; *lobes* usually less than half as long as the tube, oblong, ovate-oblong or occasionally suborbicular, 0·7—1·2 cm. long (rarely 1·4 cm.), 3—5 mm. wide (rarely 7 mm.), equal or the outer slightly longer and wider than inner. *Stamens* arising near top of perianth tube, the filaments decurrent, 2—4 mm. long, included or shortly exserted; anthers exserted, 3—5 mm. long, subsagittate. *Ovary* globose, about 2 mm. long; style reaching to base or top of anthers, the branches 1—1·5 mm. long, subspathulate, conduplicate, recurved.

HOLOTYPE. *Archer* 534 in the Bolus Herbarium.

Mountains in the Clanwilliam, Tulbagh and Ceres Divisions at altitudes up to 5,500 ft. and up to 4,000 ft. in karroid or semi-karroid districts from Worcester to Laingsburg.

Flowering period. September—November, sometimes up to January at high altitudes.

CLANWILLIAM. Elands Kloof, *Compton* 9702 (NBG); Cedarberg, Middelberg plateau. 4,000 ft., *Levyns* (CT 2266): *Esterhuysen* 12153 (BOL, PRE).

CERES. Bokkeveld Tafelberg, 5,500 ft., *Bond* 700 (NBG): *Esterhuysen* 3909 (BOL); Bonteberg, Eikenboschhoek, 4,000 ft., *Esterhuysen* 3772 (BOL); *Compton* 10003 (NBG).

TULBAGH. Great Winterhoek, 4,000 ft., *Esterhuysen* 19878 (BOL); *Marloth* 1725, 2328 (PRE).

WORCESTER. Hex River Valley near De Doorns, c. 1,700 ft., *Bolus* (BOL 13197—type of *I. bolusii*, K, PRE).

MONTAGU. Concordia Valley, *Cook*, NBG 1704/22 (BOL); same, 3,000 ft., *Levyns* 282 (CT); Koo, 4,000 ft., *Compton* 3839 (BOL); between Concordia and Eendragt, *Tredgold* 457 (PRE).

LADISMITH. Van Wyksdorp, *Archer* 534 (BOL).

LAINGSBURG. Cabidu, *Hall* 170 (NBG); *Olivier* (NBG); Tweedside, *Marloth* 10827 (PRE).

In Supplement 9 of the Kew Index *I. paucifolia* Lewis was incorrectly recorded as *I. pauciflora*.

The species differs from *I. paniculata*, to which it is most nearly allied, in having fewer leaves. usually three but sometimes only two, and smaller flowers with a shorter tube. Like *I. paniculata* it is very variable but the forms merge into one another and cannot be regarded as distinct varieties. The typical form, which occurs in karroid or semi-karroid areas, has much harder and darker corm tunics than the others, and the lowest leaf more or less falcate. In the late-flowering form from high mountains in the Ceres and Tulbagh Divisions the perianth lobes are considerably wider than in the typical, sometimes suborbicular.

35. **I. bellendenii** Foster, Contrib. Gray Herb. No. 114: 47. 1936. *Tritonia rochensis* Ker, Bot. Mag. t. 1503. 1812, excl. syn., et Gen. Irid. 114. 1827; Klatt, Abh. Naturf. Ges. Halle 12: 358 et Erganz. 24. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 207. 1895. *Ixia paniculata* var. *rochensis* (Ker) Baker, Handbk. Irid. 166. 1892 et Fl. Cap. 6: 85. 1896. *Morphixia paniculata* var. *rochensis* (Ker) Baker, Journ. Linn. Soc. Bot. 16: 97. 1877. *Ixia rochensis* (Ker) L. Bolus, Journ. Bot. 67: 133. 1929; non Ker 1802. *Waitzia rochensis* Heyn. Nom. 1: 854. 1840, *nom. illeg.*

Corm 1·5—2 cm. diam.; tunics of fine reticulate fibres. *Stem* usually 45—60 cm. high, simple or with 1—3 short curved branches. *Basal sheaths* 2—3, acuminate, 6—12 cm. long, occasionally up to 18 cm. *Leaves* 4—5, erect, the 2 or 3 basal lanceolate or ensiform, 15—40 cm. long, 0·6—1·5 cm. wide, many-veined, sometimes with the mid-rib and margins fairly prominent and cartilaginous; cauline leaves 2, sheathing. *Spike* 5—12 cm. long, laxly to fairly closely 6—12-flowered. *Bract* oblong or ovate, 0·7—1 cm. long, tricuspidate and conspicuously 3-veined or 1-veined and with a single cusp, usually colourless or pale straw-coloured; *bracteoles* bicarinate, bicuspidate. *Flowers* large, cream-coloured, faintly flushed with pink outside, usually with a small green stain at the throat; *perianth tube* 2·5—3·5 cm. long, slender, gradually and slightly expanded in the upper half, faintly striate, usually becoming curved as the flower matures; *lobes* 1·6—2 cm. long, 0·7—1 cm. wide, oblong or obovate-oblong, concave with the apex slightly involute, obtuse or emarginate. *Stamens* arising near top of perianth tube, the filaments shortly decurrent, well exserted, 7—8 mm. long; anthers 5—7 mm. long, sagittate. *Style* reaching to middle or top of anthers, the branches 3—4 mm. long, linear with the apex slightly expanded or linear-spathulate, conduplicate.

Lectotype. Botanical Magazine t. 1503.

Flowering period. October.

CALEDON. Villiersdorp, *Leipoldt* 3610 (BOL).

BREDASDORP. Baardskeedersbos, between Elim and Gansbaai, *Stokoe* (SAM 59777).

Without Locality. Bolus Herb. 15829, 21810 (collector not recorded).

A specimen in Kew Herbarium, collected by Thom and recorded as coming from Tulbagh, is probably a form of this species but differs from the plants described above in having slightly shorter filaments, longer anthers and longer style branches (5 mm.).

The species is very closely allied to *I. longituba* but has somewhat larger flowers, usually with a longer tube more gradually expanded in the upper half, often becoming curved as the flower matures, and slightly longer stamens. When Ker described and figured it as *Tritonia rochensis* in 1812 he made no reference to *Ixia aristata* Ker (= *I. longituba*) but mentioned as nearly allied species *Tritonia longiflora*, *T. capensis* and *T. pallida*. The first is *Ixia paniculata* and the other two are species placed in the genus *Tritonia* as it stands at present.

Baker transferred *Tritonia rochensis* to *Ixia* as a variety of *I. paniculata* but it is quite distinct from that species, having different leaves, a shorter perianth tube with comparatively longer lobes and very much longer filaments far exserted from the tube. In 1929 Dr. L. Bolus raised it to specific status, retaining Ker's epithet, but seven years later it was renamed *I. bellendenii* by Foster. As he explained, *I. rochensis* based upon *Tritonia rochensis* Ker in Bot. Mag. t. 1503 was a later homonym of *Ixia rochensis* Ker in Bot. Mag. t. 598 (1802), and although Ker transferred *I. rochensis* to *Geissorrhiza* in 1805, its brief existence in *Ixia* prevents the use of the specific name for another species.

36. **I. longituba** N. E. Br. (Fig. 5), Journ. Linn. Soc. Bot. 48: 44. 1928. *I. aristata* sensu Ker, Bot. Mag. t. 589. 1802, excl. syn.; Baker, Handbk. Irid. 162. 1892 et Fl. Cap. 6: 79. 1896; non Thunb. 1783.

Corm ovoid or subglobose, 1—1·8 cm. diam.; tunics of fairly fine fibres, vertical below becoming confluent and reticulate above the middle. *Stem* 35—75 cm. high (average 40—55 cm.), simple or with 1—3 short stiff curved branches with the lower half more or less patent and spike erect. *Basal sheaths* 1—2, acute or acuminate, 1·5—8 cm. long, the lower sometimes subhyaline and obtuse. *Leaves* 5—6, the 3 basal lanceolate or ensiform, usually much shorter than the stem, 10—30 cm. long, 0·8—1·4 cm. wide, firm, many-veined, with narrow cartilaginous margins, often spirally twisted, and the 2 or 3 cauline leaves longer, almost entirely sheathing. *Spike* 4—7 cm. long, fairly laxly 6—12-flowered. *Bract* oblong or ovate, 6—7 mm. long (sometimes to 9 mm.), tricuspidate and 3-veined or 1-veined with a cusp and 2 short teeth, pale pinkish mauve or straw-coloured, occasionally minutely brown-flecked at the apex; *bracteoles* bicarinate, bicuspidate. *Flowers* pale to deep pink, the outer lobes darker outside, or occasionally white; *perianth tube* 1·8—2 or sometimes to 3·2 cm. long but in the southern form only 1·2—1·8 cm. long, slender, cylindrical with the upper third or quarter slightly and gradually expanded upwards

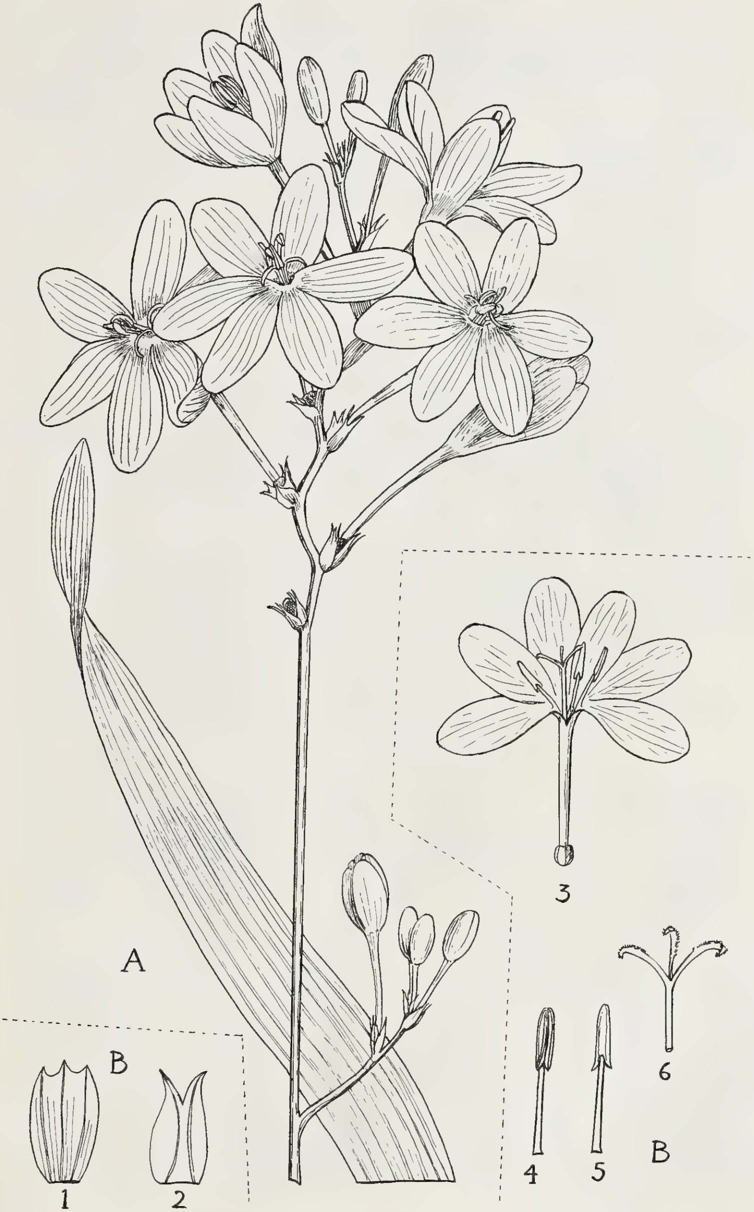


FIG. 5.—*I. longtituba.* A. Copied from Bot. Mag. t. 589 (*I. aristata* sensu Ker). B. *Lewis* No. 5562. 1. Bract × 2. 2. Bracteoles × 2. 3. Flower laid open. 4. Stamen, front view, × 2. 5. Stamen, back view, × 2. 6. Top of style × 2. Del. G. J. Lewis.

1·5—4 mm. diam. at the throat, sometimes subinfundibuliform; *lobes* oblong, obtuse or subemarginate, 1·2—2 cm. long, 0·7—1 cm. wide, the outer 1—2 mm. wider than inner, usually shorter or about as long as the tube but in the southern form slightly longer. *Stamens* arising slightly below top of perianth tube, the filaments shortly decurrent, 5—8 mm. long, well exserted; anthers 4—6 mm. long, subsagittate. *Ovary* rotund or obovoid, 2·5—3 mm. long; style reaching to middle of filaments or to middle of anthers, the branches filiform or linear-spathulate, conduplicate, 3—6 mm. long.

LECTOTYPE. Botanical Magazine t. 589.

Low slopes of mountains, hills and flats in the Caledon, Bredasdorp and Swellendam Divisions.

Flowering period. September—November.

CALEDON. *Prior* (K); near Genadendal, *Drege* 8375 (BM, G, K, P); Rietkuil, *Zeyher* 4013 (K); between Sonderend and Breede Rivers, *Zeyher* 4016 (K, PRE, SAM, S, Z); near Sonderend River, *Zeyher* (BOL, SAM); River Sonderend Mts., near Stormsvlei, Hassaquaskloof and Breede River, *Ecklon* and *Zeyher* 283 (G); 6 miles W. of River Sonderend, *Lewis* 5562 (NBG).

BREDASDORP. The Poort, near Bredasdorp, *Van Niekerk* 322 (NBG); between Napier and Caledon, *Steytler* (BOL 21748); between Bredasdorp and Elim, *Dymond* (BOL); *Loubser* 887 (NBG).

SWELLENDAM. *Van der Merwe*, NBG 1780/29 (BOL).

WITHOUT LOCALITY. *Thunberg* (S).

Some specimens in the South African Museum Herbarium collected by Leipoldt are recorded as coming from Clanwilliam but this must be a mistake as the species is not known to occur in that area.

In his notes on the South African Iridaceae of Thunberg's herbarium, Dr. N. E. Brown drew attention to the fact that the plant figured and described by Ker as *I. aristata* in the Botanical Magazine, t. 589, was not the same as *I. aristata* Thunb., and renamed it *I. longituba*. The type of *I. aristata* Thunb. is a small form of *I. campanulata* Houtt. (See note under that species.)

The length of the perianth tube is very variable in *I. longituba*. Specimens of *Drege* 8375 in Kew Herbarium, with a slender cylindrical tube up to 3·2 cm. long and lobes about half its length, were identified as *I. paniculata* var. *tenuiflora* by Baker, but the leaves, bracts, and flowers with well exserted stamens, are like those of *I. longituba* and not as in *I. paniculata*. In the Caledon Division the tube is generally about 2 cm. long and the lobes more or less the same length but towards the Bredasdorp Division it becomes shorter and in some of the southern forms it is only 1·2 cm. long and slightly shorter than the lobes.

SUBGENUS **DICHONE**

Ixia subgenus *Dichone* (Salisb. ex Baker) Lewis comb. nov.

Tritonia Ker subgenus *Dichone* Salisb. ex Baker, Handbk. Irid. 190. 1892 et Fl. Cap. 6: 118. 1896.

Tritonia Ker section *Dichone* "Laws." Salisb. ex Baker, Journ. Linn. Soc. Bot. 16: 162. 1877; Pax in Engl. & Prantl Pflanzenfam. II. 5: 155. 1888; Diels, ed. 2. 15 a: 490. 1930.

Dichone Laws. ex Salisb. Trans. Hort. Soc. 1: 320. 1812, nomen nud.

Tritonixia Klatt section *Dichone* (Salisb. ex Baker) Klatt, Abh. Naturf. Ges. Halle 12: 357 et Erganz. 23. 1882.

Tritonixia sensu Dur. & Schinz, Consp. Fl. Afr. 5: 209. 1895 (excl. sp. No. 1, *T. conferta* Klatt).

Agretta Eckl. Top. Verz. 23. 1827, nomen nud.

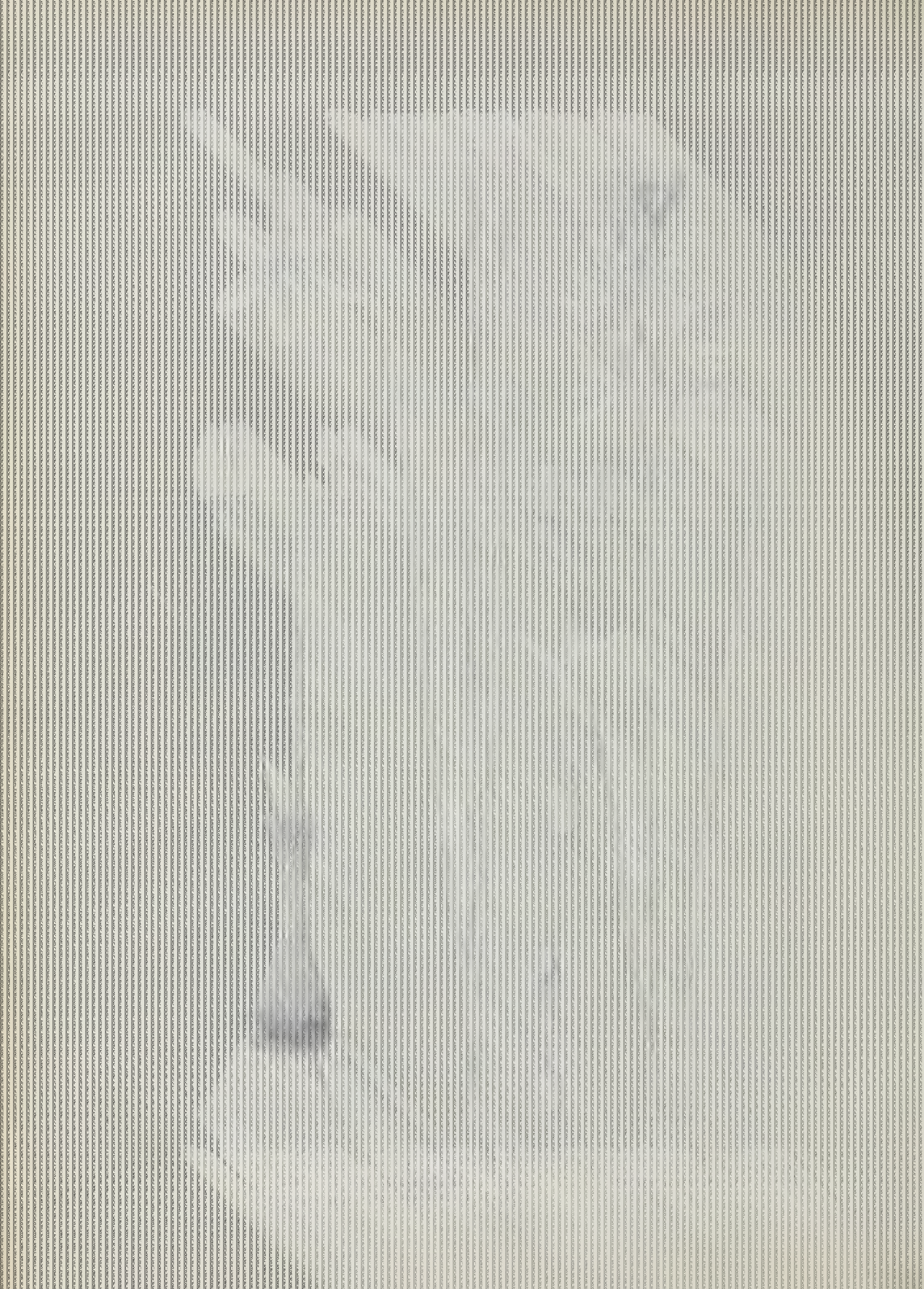
Flowers usually actinomorphic, in one or two species zygomorphic; *perianth tube* short, cylindrical, slender; *lobes* longer than the tube; *stamens* arising at top of perianth tube, usually symmetrically disposed but in one or two species the filaments slightly twisted and anthers reclinate, pendulous and not symmetrically disposed; filaments short; anthers small, suborbicular to oblong, often subdidymous, the cells opening widely from base to apex or by a narrow slit not extending to the apex; *style* reaching to top of perianth tube or shortly above, the branches involute-filiform or involute-cylindrical, straight or recurved, minutely clavellate or papillate at the apex only.

(Exceptions: flowers zygomorphic in *I. scillaris* and sometimes in *I. curvata*).

Type species: *I. crispa* L.f.

37. **I. micranda** Baker (Fig. 6), Journ. Bot. 1876, 237, Handbk. Irid. 162. 1892 et Fl. Cap. 6: 78. 1896; Klatt, Erganz. 62. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 185. 1895. *I. filifolia* Pappe ex Baker, Fl. Cap. 6: 78, *nomen nud.* ?*Agretta grandiflora* Eckl. Top. Verz. 23. 1827, *nomen nud.*

Corm globose, 1·3—2 cm. diam.; tunics matted, of very fine reticulate fibres extending up in a neck 1·5—4 cm. long. *Stem* filiform, simple, 20—60 cm. high. *Basal sheaths* 2 or 3, 3—7 cm. long, often partly concealed by the neck fibres. *Leaves* 2 (rarely 3), the lower 12—30 cm. long with the lower part sheathing and blade very narrow, usually terete, subterete or filiform, 0·5—1·25 mm. wide, striate with more or less prominent margins and mid-rib; upper leaf usually longer than lower, reaching above middle of stem, sometimes almost entirely sheathing. *Spike* short, 2—6-flowered, capitate, or somewhat longer and laxer, the rachis sometimes flexuose. *Bract* oblong or ovate-oblong, 5—8 mm. long, shortly tridentate



or tricuspidate, pellucid, colourless, brownish or pinkish mauve, with 3 or several veins; *bracteoles* bicarinate, shortly bicuspidate or bidentate. *Flowers* actinomorphic, white, pale to deep pink, mauve-pink or mauve; *perianth tube* filiform, 3—5 mm. long, not or very little exserted from the bract; *lobes* connate for 0·5—1 mm., oblong, obtuse or sometimes subacute or retuse, 1—2 cm. long, 5—7 mm. wide, equal or the outer slightly shorter and wider than inner. *Stamens* arising at top of perianth tube, symmetrically disposed; filaments very short, filiform, up to 1·5 mm. long; anthers subdidymous, oblong or suborbicular, 1·5—3 mm. long, 1—1·5 mm. wide, with a fairly narrow connective, the cells opening to the apex. *Ovary* oblong-rotund, 2—3 mm. long; style reaching to base of filaments, with involute-filiform branches 3—4 mm. long, minutely ciliate at the apex.

LECTOTYPE. *Zeyher* 4011 in Kew Herbarium.

Mountain slopes and hills in the Caledon and Bredasdorp Divisions.

Flowering period. July—August, occasionally up to October.

CALEDON. Houwhoek, *Zeyher* 4011 (K, PRE, SAM, S, Z); *van Niekerk* 395 (BOL); *Loubser* 931 (NBG); *Bolus* 12336 (BOL); *Ecklon* and *Zeyher* 92 (BM, G, K, SAM); near Bot River, *MacOwan* 2657, HNAA 262 (BM, BOL, G, K, SAM, UPS); *Barker* 113 (BOL, K); Sir Lowrys Pass to Hermanus, *Guthrie* 2005 (NBG); near Palmiet River and Houwhoek, *Drege* 8372 (BM, G, L, K, P); Elgin, *Lewis* 2002 (SAM); near Kleinmond, *Middelmann* (NBG); *Barker* 1 (BOL, K); Palmiet River Mts., *Middelmann* (BOL 24535); *Wilman* 627 (BOL, PRE); Palmiet River Mouth, *Davis* (SAM 60175); Caledon, *Guthrie* 2531 (BOL); *Purcell* (SAM); Swartberg, near Caledon, *Pappe* (K); *Worsdell* (K); *Zeyher* 4009 (K, PRE, Z); Shaws Pass, *Lewis* 3643 (SAM); Genadendal Mts., *Galpin* 4686 (BOL, K, PRE); River Sonderend Mts., *Stokoe* (SAM 57998); Highlands, *Lewis* 5733 (NBG).

BREDASDORP. Near Napier, *van Breda* 496 (M, PRE); near Bredasdorp, *van Niekerk* 430 (BOL); near Elim, *Guthrie* 3824 (NBG); *Smith* 3182 (PRE).

WITHOUT LOCALITY. *Thom* 357 (K); *Thunberg* (S).

Baker cited six collections when he described this species but did not designate any one as the type. Of these, *Zeyher* 4011, in Kew Herbarium, has been selected as the lectotype.

The species has been transferred to the subgenus *Dichone* on account of its small anthers and involute-filiform style branches which are stigmatic only at the apex. The two varieties described below have even smaller and more rounded anthers with the cells not opening right to the apex, the pollen being shed through a narrow slit, and shorter cylindrical style branches. Except for these differences there is little in the general appearance of the plants, especially the var. *minor*, to distinguish them from *I. micrandra*, with which they have generally been identified in herbaria.

Var. **minor** Lewis var. nov. (Fig. 7 B).

A var. *micrandra* filamentis brevioribus latioribus, antheris subsessilibus suborbicularibus thecis non ad apicem dehiscentibus, ramis styli brevioribus latioribus plus minusve tubulosis, differt.

Differs from var. *micrandra* in having shorter and wider filaments, the anthers subsessile, suborbicular with the cells not opening to the apex, and the style branches shorter, wider and more or less tubular.

Holotype. *Hutchinson* 481 in the Bolus Herbarium.

Flowering period. September—October, rarely August.

SOMERSET WEST. Lower W. slopes of Sir Lowrys Pass, *Lewis* 5731 (NBG).

CALEDON. Hottentots Holland Mts., *Hutchinson* 481 (BOL, K, PRE); *Pappe* (BM, K); *Phillips* (SAM); *Esterhuysen* 9123 (BOL); *Stokoe* (SAM 60172); Sir Lowrys Pass, *Bolus* 7850 (BOL, K); *MacOwan* HNAA 1788 (BOL, G, SAM, UPS, Z); *Werdermann* and *Oberdieck* 187 (B, PRE); Steenbras Siding, *Stokoe* (SAM 58000); slopes W. of Kogelberg, *Esterhuysen* 23142 (BOL); Elgin, *Barker* 2012 (NBG); *Cohen* (NBG); Highlands, *Henderson* 1110 (NBG); *Leighton* 284 (BOL); between Viljoens Pass and French Hoek Pass, *Stokoe* (SAM 60171); Houwhoek Pass, *Story* 3057 (PRE); Palmietrivier, *Penther* 586 (M, Z); Klein River Mts., *Zeyher* 4010 (K).

PAARL. Wemmershoek Mts., *Wasserfall* 482 (NBG); same, 3,000—4,000 ft., *Esterhuysen* 9060 (BOL); near Wemmershoek, 2,000 ft., *Phillips* 1313 (SAM); French Hoek Pass, 2,200 ft., *Barker* 4141 (NBG); *Strey* (M); French Hoek Forest Reserve, *Lewis* (BOL).

Without Locality. *Stanger* (K); *Prior* (K); *Jameson* (K).

This variety usually flowers a month or two later than var. *micrandra* but the flowering period of both is somewhat variable. The vegetative parts and general appearance are the same but they can readily be distinguished by the differences in the stamens and style branches.

Var. **confusa** Lewis var. nov. (Fig. 7 A). *I. polystachia* sensu Ker, Bot. Mag. t. 629. 1803; non L. 1762. *Watsonia retusa* Klatt, Abh. Naturf. Ges. Halle 12: 354 et Erganz. 20. 1882; Baker, Handbk. Irid. 178. 1892 et Fl. Cap. 6: 105. 1896; Dur & Schinz, Consp. Fl. Afr. 5: 195. 1895.

A var. *micrandra* foliis planis plerumque latioribus, filamentis paulo longioribus, antheris suborbicularibus vel late oblongis thecis non ad apicem extremum dehiscentibus, ramis styli brevioribus recurvis interdum minute bifidis, differt.

Cormus var. *micrandrae* similis sed interdum fibris non in collo pro-

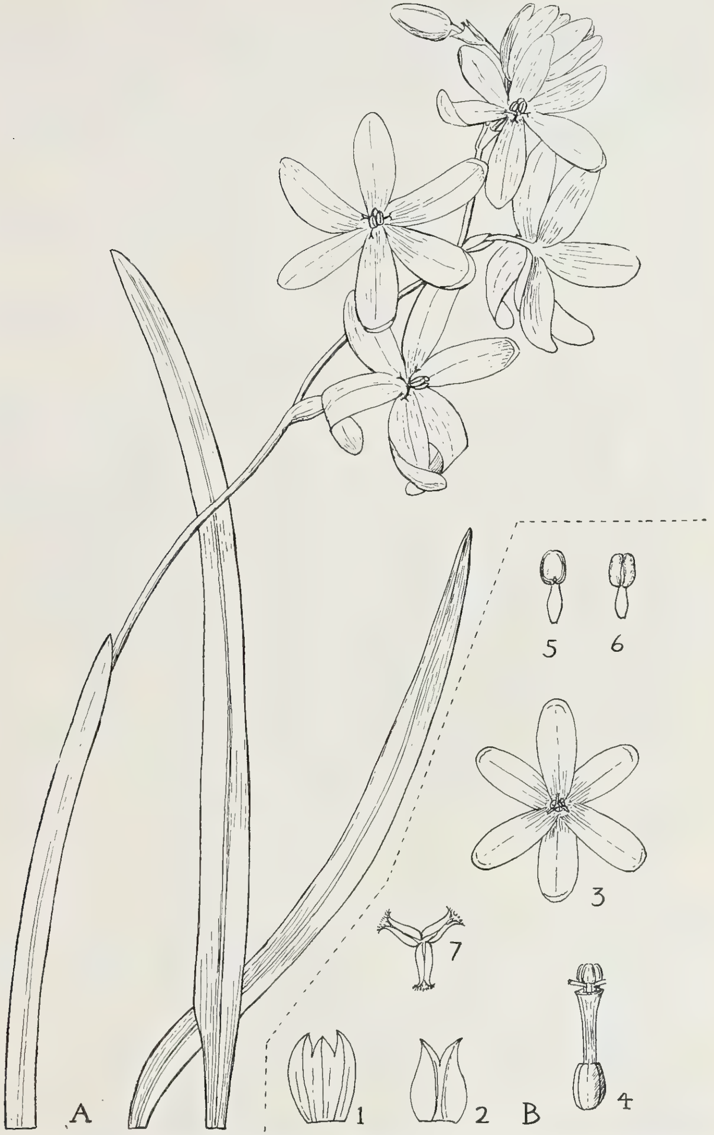


FIG. 7.—A. *I. micrandra* var. *confusa.* Copied from Bot. Mag. t. 629 (*I. polystachia* sensu Ker). B. *I. micrandra* var. *minor. Lewis* No. 5731. 1. Bract × 2. 2. Bracteoles × 2. 3. Flower. 4. Flower, side view, perianth lobes removed, × 2. 5. Stamen, front view, × 3. 6. Stamen, back view, × 3. 7. Style branches from above × 5. Del. G. J. Lewis.

ductis. *Folia* 2—4, breviter vel longe vaginantia, lamina lineari vel lanceolata 1—6 mm. lata, molli vel subrobusta, interdum marginibus et nervo medio leviter prominentibus. *Caulis, spica, bractea* var. *micrandrae* similes. *Flores* rosei vel lilacino-rosei, interdum ad medium macula parva rubella notati; *perianthii tubus* 3—4 mm. longus; *segmenta* oblonga vel obovato-oblonga obtusa, 1—1·7 cm. longa, 5—7 mm. lata. *Filamenta* 1·5—2 mm. longa; antherae suborbiculares vel late oblongae, 2—3 mm. longae, thecis non ad apicem extremum dehiscentibus. *Stylus* ad apicem tubi perianthii attingens, ramis involuto-cylindricis falcatis vel recurvis, circa 1·5 mm. longis, interdum minute bifidis.

Differs from var. *micrandra* in having flat, usually wider leaves, slightly longer filaments with suborbicular or broadly oblong anthers opening by a narrow slit extending nearly to the apex, and shorter recurved style branches sometimes minutely bifid.

Corm as in var. *micrandra* but sometimes without a neck of fibres. *Leaves* 2—4, with a fairly short to long sheath and linear or lanceolate blade 1—6 mm. wide, soft or moderately firm, the margins and mid-rib sometimes slightly prominent. *Stem, spike* and *bract* as in var. *micrandra. Flowers* pale to deep pink or mauve-pink, sometimes with a small reddish mark in the middle; *perianth tube* 3—4 mm. long; *lobes* oblong or obovate-oblong, obtuse, 1—1·7 cm. long, 5—7 mm. wide. *Filaments* 1·5—2 mm. long; anthers suborbicular or broadly oblong, 2—3 mm. long, the cells opening by a narrow slit extending nearly to the apex. *Style* reaching to top of perianth tube, the branches involute-cylindrical, falcate or recurved, about 1·5 mm. long, sometimes minutely bifid.

HOLOTYPE. *Compton* 18481 in the Compton Herbarium, Kirstenbosch.

Hills and mountain slopes from 700 to 5,000 ft.

Flowering period. Mostly September—November, sometimes August and at high altitudes November—December.

WORCESTER. Stettynsberg, *Esterhuysen* 15590 (BOL, NBG, PRE); *Stokoe* (SAM 60174).

BREDASDORP. Near Elim, *Smith* 3182 (PRE).

SWELLENDAM. Hill below Crown Mt., 700 ft., *Wurts* 301 (NBG); Swellendam, *Fry* in Herb. Galpin 4996 (PRE).

MONTAGU. Donkerkloof, 2,500 ft., *Compton* 18481 (BOL, NBG); *Lewis* 1499 (SAM); Langeberg, near Montagu, *Esterhuysen* 23833 (BOL).

RIVERSDALE. Garcias Pass, 1,200 ft., *Thorne* (SAM 41609).

GEORGE. Montagu Pass, *Marloth* 2429 (PRE).

OUDTSHOORN. Meiringspoort, *Esterhuysen* 24880 (BOL).

OUDTSHOORN—PRINCE ALBERT. Swartberg Pass, c. 5,000 ft., *Bolus* (BOL 12336); *Stokoe* (SAM 55754, 58724, 63516); *Hafström* and *Acocks* 311 (PRE, S); *Werdermann* and *Oberdieck* 843 (B, PRE).

The plant figured as *I. polystachia* on plate 629 of the Botanical Magazine has been the source of considerable confusion due to a series of misidentifications. Ker identified it with *I. polystachya* Jacq. Ic. t. 275—not *I. polystachya* L. which he placed as a synonym of *I. erecta* Berg. under plate 623 of the Botanical Magazine—though he observed that the flowers of his specimen were unusually large and the stem simple.

On comparing the Botanical Magazine figure with Jacquin's illustration and with the large amount of herbarium material now available, I have found that the plants depicted belong to two different species. Among the collections from the Worcester and Montagu Divisions cited above are some plants with wide leaves which almost exactly match the Botanical Magazine figure, the only significant difference being that the style branches are very slightly bifid instead of conspicuously so as shown in the figure, but as Ker remarked in the description that "the hiant stigmas should be observed with a glass", there is no doubt that this feature was exaggerated by the artist. In the collections cited above the leaves vary from 1 to 6 mm. in width, but apart from the flat, usually wider and sometimes more numerous leaves, and the slight differences in the floral characters recorded above, there is little to distinguish some of the forms from *I. micrandra* and I consider that they cannot be regarded as other than a somewhat variable variety.

The plant figured by Jacquin represents a different species, *I. stricta* (Klatt) Lewis, which differs in having a stiff erect branched stem, firm erect leaves with prominent stramineous veins, and considerably smaller flowers. Several collections exactly match Jacquin's figure, among them *Zeyher* 4008, cited by Klatt under *Tritonixia stricta* Klatt, and specimens distributed as *Agretta stricta* Eckl., a *nomen nudum.* Under *Tritonixia stricta* Klatt cited Jacquin's plate and also Botanical Magazine t. 629, but in the same work he described the plant figured in the Botanical Magazine as *Watsonia retusa* Klatt, probably intending it to be a new combination though this is not certain as he did not refer to *Ixia retusa* Salisb., which Ker had cited in the synonymy.

Baker added to the confusion about the identity of these plants by his treatment of them in the sixth volume of the Flora Capensis. He upheld *Watsonia retusa* Klatt (p. 105) but stated that it was known only from the figure cited and that the habit was so entirely that of an *Ixia* that he thought the style branches were drawn bifid by some mistake of the artist. However, on page 120 he listed both *I. polystachya* Jacq. Ic. t. 275, and *I. polystachia* Ker, Bot. Mag. t. 629, as synonyms of *Tritonia scillaris* (L.) Baker, and reduced *Tritonixia stricta* Klatt to a variety of that species, for which he gave only one synonym, *Agretta stricta* Eckl.

38. **I. crispa** L.f. Suppl. 91. 1781; Thunb. Diss. Ixia 9. t. 2. f. 3. 1783, Prod. 9. 1794 et Fl. Cap. ed. Schultes 57. 1823; Ker, Bot. Mag. t. 599. 1802; Red. Lil. t. 433. 1816. *Dichone crispa* (L.f.) Laws. ex Salisb., Trans. Hort. Soc. 1: 320. 1812. *Agretta crispa* (L.f.) Eckl. Top. Verz. 24. 1827, *nomen nud. Tritonia undulata* (Burm. f.) Baker, Journ. Linn. Soc. Bot. 16: 163. 1877, Handbk. Irid. 191. 1892 et Fl. Cap. 6: 121. 1896, as to plant described; Marloth, Fl. S. Afr. 4: 145. t. 42 b. 1915. *Tritonixia undulata* (Baker) Klatt, Abh. Naturf. Ges. Halle 12: 357 et Erganz. 23. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 209. 1895. *Tritonia thunbergii* N. E. Br., Kew Bull. 1929. 137; Foster, Contrib. Gray Herb. No. 114: 46. 1936.

Corm ovoid, 0·7—1 cm. diam., often caespitose; tunics of fine matted fibres extending up in a neck 0·5—3 cm. long. *Stem* slender, flexuose, 12—30 cm. high, nearly always simple. *Leaves* 4—6, linear or lanceolate, the margins crisped or undulated more or less to the mid-rib, 5—12 cm. long, 2—5 mm. wide. *Spike* laxly 2—10-flowered, the rachis usually flexuose. *Bract* ovate, trifid, tricuspidate or tridentate, 2—4 mm. long, pellucid, usually colourless below and purplish towards the apex; *bracteoles* bifid. *Flowers* actinomorphic, small, pink, usually with a narrow reddish ring outlining a small green stain in the middle; *perianth tube* filiform, 2—3 mm. long; *lobes* patent, slightly concave, equal, oblong or obovate-oblong, obtuse or subretuse, 0·8—1·1 cm. long, 4—6 mm. wide. *Stamens* arising at top of perianth tube, symmetrically disposed; filaments 2—3 mm. long; anthers subdidymous, ovate-oblong to orbicular, about 2 mm. long, the cells obtuse at the apex, recurved and acute at the base, opening by a narrow slit extending nearly to the apex. *Ovary* rotund, 2 mm. long; style reaching to top of perianth tube, the branches slender, cylindrical, slightly expanded at the apex, falcate or recurved, 1·5—2 mm. long.

HOLOTYPE. *Thunberg* 313 (sheet 58·10) in the Linnaean Herbarium.

Stony clay flats and hill slopes in the south-western districts of the Cape Province.

Flowering period. August—September.

PIKETBERG. Versveld Pass, *Thomas* (NBG); Piketberg, *Guthrie* 2733 (NBG); Piketberg road, *MacOwan* HNAA 1545 (G, K).

TULBAGH. *Schlechter* 1400 (BM, G, K); *Esterhuysen* 17474 (BOL); Roodesand, *Thunberg* (UPS); Tulbagh Kloof, *Ecklon* and *Zeyher* 244 (G, SAM); near Artois, *Bolus* (BOL 26898).

WORCESTER. *Zeyher* (K).

MALMESBURY. Near Malmesbury, *MacOwan* HNAA 1545 (K, SAM).

WELLINGTON. Near Wellington, *Grant* 2383 (BOL); near Huguenot Station, *Lewis* 1500 (SAM).

PAARL. Berg River near Paarl, *Drege* 1557 (P); between Paarl and

Klein Drakenstein Mts., *Drege* (K, P); Paarl, *Loubser* 469 (NBG); *Ecklon* 10 (BM, G, M, K); Daljosaphat, *Middlemost,* NBG 1364/37 (NBG).

SOMERSET WEST. Hottentots Holland, *Ecklon* and *Zeyher* (SAM).

P. CALEDON. *Prior* (K); *Matthews,* NBG 262/13 (BOL); Bot River, *Pillans* 1142 (BOL); Villiersdorp, *Grey* (K).

WITHOUT LOCALITY. *Thunberg* 313 (LINN); *Thunberg* (G, UPS—*I. crispa* sheet a); *Drege* (BM, G); *Thom* (K); *Oldenburg* 937 (BM); *Bowie* 13 (BM).

The locality given for *Bowie* 13 is "near Wynberg" but it is doubtful if this is correct.

This species was the only one placed in the undefined genus *Dichone* by Salisbury and was therefore the type of *Tritonia* subgenus *Dichone* as defined by Baker, and remains the type of the subgenus on its transfer from *Tritonia* to *Ixia.* Like many species of *Ixia* it was involved in a misidentification which, in this case, led to two changes in the specific epithet, but on its transfer back to the genus *Ixia* it reverts to the original name, *I. crispa,* L.f.

In 1802 it was figured as *I. crispa* in the Botanical Magazine, t. 599, where Ker cited *I. undulata* Burm. f. as a synonym, and seventy-five years later, when Baker removed it to *Tritonia,* he adopted Burmann's epithet as the name *Tritonia crispa* was already used for another species. It is obvious that neither Ker nor Baker saw the type of *Ixia undulata* in Burmann's herbarium as the plant is so entirely different that they could not have identified it with *I. crispa.* The mistake was pointed out by Dr. N. E. Brown in 1929 in his paper on the Iridaceae of Burmann's Florae Capensis Prodromus (Kew Bull. 1929, p. 137), in which he retained the name *Tritonia undulata* for Burmann's plant, giving a detailed description of it, and renamed the Linnaean plant *T. thunbergii.* Some amendments to the nomenclature were made by Dr. Foster in 1936 (Contrib. Gray Herb. No. 114, 46).

39. **I. stricta** (Eckl. ex Klatt) Lewis comb. nov. *Tritonixia stricta* Eckl. ex Klatt, Abh. Naturf. Ges. Halle 12: 357 et Erganz. 23. 1882, excl. syn. *Ixia polystachia* Red.; Dur. & Schinz, Consp. Fl. Afr. 5: 209. 1895. *Agretta stricta* Eckl. Top. Verz. 23. 1827, *nomen nud. Ixia polystachya* sensu Jacq. Ic. t. 275. 1786—93 et Coll. 3: 269. 1789; non L. 1762. *I. polystachia* var. *incarnata* Andr. Bot. Rep. t. 128. 1801. *I. scillaris* L. var. *angustifolia* Ker, Bot. Mag. sub. t. 542. 1801. *Tritonia scillaris* Baker, Journ. Linn. Soc. Bot. 16: 163. 1877, pro parte. *T. scillaris* var. *stricta* (Klatt) Baker, Handbk. Irid. 191. 1892 et Fl. Cap. 6: 120. 1896. ? *Ixia retusa* Salisb. Prodr. 35. 1796.

Corm ovoid or subglobose, 1—2 cm. diam.; tunics of coarse vertical confluent fibres, slightly comose at the apex. *Stem* slender, 35—55 cm. high, simple or with 1—3 short suberect more or less flexuose branches. *Basal sheaths* 2, acute, 2—8 cm. long, the upper usually brown. *Leaves* 3—4, erect, lanceolate, firm or somewhat rigid with thickened stramineous margins and mid-rib, 12—35 cm. long, 3—9 mm. wide, often brown and spirally twisted towards the apex at flowering time. *Spike* fairly laxly 6—16-flowered, the rachis usually flexuose. *Bract* small, oblong or obovate, subtruncate, obtuse, acute or shortly tridentate, 3—5 mm. long, pellucid, colourless or the upper half sometimes purplish; *bracteoles* slightly shorter than bract, bicarinate, bidentate. *Flowers* actinomorphic, small, pale to deep pink with a small darker pink star in the middle; *perianth tube* filiform, 5 mm. long; *lobes* patent, obovate or oblong, obtuse or retuse, 0·7—1 cm. long, 3—5 mm. wide. *Stamens* arising at top of perianth tube, erect, symmetrically arranged; filaments 1·5—2 mm. long; anthers broadly oblong, about 2 mm. long, subdidymous, the cells obtuse at base and apex, opening by a narrow slit extending nearly to the apex. *Ovary* rotund, about 2 mm. long; style reaching to top of perianth tube, the branches involute-cylindrical, 1·5—2 mm. long, falcate or recurved, minutely bifid and ciliate at the apex.

LECTOTYPE. *Zeyher* 4008 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Hills and mountain slopes in the Caledon and Bredasdorp Divisions.

Flowering period. November—December.

CALEDON. Swartberg, *Zeyher* 4008 (K, SAM); *Pappe* (BOL); Houwhoek, *Schlechter* 9411 (BM, BOL, G, K); *Guthrie* 3580 (NBG); Elgin district, *Elbrecht* (PRE); Sondags Kloof, *Compton* 10258 (NBG); Kleinmond, *Taylor* 3778 (NBG).

BREDASDORP. Near Napier, *Salter* 4151 (BOL, K); Elim, *Barker* 7774 (NBG); Bredasdorp, mountain slopes, *Galpin* (PRE 10463).

As the type of *Tritonixia stricta*, *Zeyher* 4008 in Herb. Lubeck, Berlin-Dahlem Herbarium, is presumed to have been destroyed during the last war, a specimen of Zeyher's with the same number in the South African Museum Herbarium has been selected as the lectotype. It is named *Agretta stricta* Eckl. by Zeyher, agrees with Klatt's description, and is almost certainly an isotype.

Ixia retusa Salisb. has been placed with a query in the synonymy as I have not seen any specimen so named by Salisbury and the brief description leaves some doubt as to the identity of his plant. If the type has been preserved and proves to be this species then his name should be used for it.

In a note under *I. micrandra* var. *confusa* I have already mentioned that Ker identified *I. retusa* Salisb. with the plant figured as *I. polystachia* on plate 629 of the Botanical Magazine (i.e. *I. polystachia* Ker, not of Linnaeus) and that Klatt later described the plant figured as *Watsonia retusa*, while in the same work he cited *Ixia scillaris* var. *angustifolia* Ker, Bot. Mag. sub. t. 542 and Bot. Mag. t. 629 in the synonymy under *Tritonixia stricta*. The latter should be omitted from the synonymy since I consider that the Botanical Magazine plate represents a form of *I. micrandra* var. *confusa* Lewis, whereas the plant figured by Jacquin as *I. polystachya* (Ic. t. 275), with which Ker identified it, represents the species described above as *I. stricta*, and the collections cited above match Jacquin's figure. Klatt's reference to *I. polystachia* Red. Lil. t. 126 must also be excluded as this plant is *I. flexuosa* L.

40. **I. trinervata** (Baker) Lewis comb. nov. *Tritonia trinervata* Baker, Handbk. Irid. 191. 1892 et Fl. Cap. 6: 121. 1896; Dur. & Schinz, Consp. Fl. Afr. 5: 208. 1895.

Corm subglobose, 1—1·5 cm. diam.; tunics of fairly fine to moderately coarse vertical confluent fibres, somewhat comose at the apex. *Stem* slender, simple, 20—40 cm. high. *Basal sheaths* 2, firm, usually long, the upper sometimes green at the apex. *Leaves* 2, firm, usually with 3 more or less prominent stramineous veins, the lower leaf 12—24 cm. long with the lower third to half sheathing and a subarcuate or suberect lanceolate blade 0·4—1 cm. wide, the upper leaf almost entirely sheathing, varying from shorter to longer than the lower. *Spike* 3—12-flowered, short and compact to fairly long and lax. *Bract* ovate, subtruncate, obtuse or tridentate, 4—5 mm. long, pellucid, pale to deep mauve-pink or purplish, usually with 3 to several veins; *bracteoles* bicarinate, bidentate or bicuspidate. *Flowers* actinomorphic, bright pink or deep mauve-pink; perianth tube filiform, 4—6 mm. long; *lobes* patent, equal, oblong, obtuse or retuse, 1·2—1·5 cm. long, 5—8 mm. wide. *Stamens* arising at top of perianth tube, erect, symmetrically disposed; filaments 2—3 mm. long; anthers broadly oblong or suborbicular, subdidymous, 2—2·5 mm. long, the cells obtuse at base and apex, opening by a narrow slit extending nearly to the apex. *Ovary* rotund, about 2 mm. long; style reaching to top of perianth tube, the branches involute-cylindrical, falcate or recurved, about 4 mm. long, slightly expanded at the apex and sometimes very shortly bifid.

HOLOTYPE. *Ecklon* and *Zeyher* 242 in Kew Herbarium.

Hills and mountain slopes in the Caledon Division.

Flowering period. September.

CALEDON. Lebanon Forest Reserve, Elgin, *Lewis* 4178 (SAM); *Martin* 1043 (NBG); Elgin, *Linley* (SAM); Caledon Commonage, *Barker* 143 (BOL); Caledon, near Mission, *Matthews* (BOL 26872); Appels Kraal, River Sonderend, *Ecklon* and *Zeyher* 242 (G, K, Z).

This species is very near *I. stricta* from which it differs in having only two leaves, the lower usually half sheathing with a short subfalcate blade, and larger flowers with longer style branches. It flowers in the spring and *I. stricta* in the summer.

41. **I. brevituba** Lewis sp. nov.

Cormus subglobosus, circa 2 cm. diam., tunicis e fibris subrobustis in collo 10—13 cm. longo productis, compositis. *Caulis* gracilis rectus, 35—50 cm. altus, ramis brevibus 1—2. *Folia* 4—5, linearia vel lineari-lanceolata subfalcata vel erecta, 18—45 cm. longa, 1·5—4 mm. lata, firma, marginibus et nervo medio et 1—2 alteris subprominentibus. *Spica* sat laxe 5—10-flora, rachide plerumque flexuoso. *Bractea* oblonga acuta, 7—9 mm. longa, pellucida vel sine colore vel ex parte purpurina, nervis fuscis 1 vel 3; *bracteolae* quam bractea aequilongae, bicarinatae bidentatae. *Flores* regulares subcaerulei vel lilacino-caerulei cyaneo suffusi: *perianthii tubus* brevissimus cylindricus, 1—1·5 cm. longus, in bractea inclusus; *segmenta* aequalia, oblonga vel obovato-oblonga obtusa, circa 1—1·2 cm. longa, 5—7 mm. lata. *Stamina* ad apicem tubi perianthii orta, congruenter disposita, filamentis 2 mm. longis et antheris oblongis 5 mm. longis per margines a fundo ad apicem late dehiscentibus. *Ovarium* rotundum, circa 2 mm. longum; stylus ad apicem tubi perianthii attingens, ramis involuto-filiformibus circa 3 mm. longis apice stigmatifero.

Corm subglobose, about 2 cm. diam.; tunics of moderately coarse fibres extending up in a neck 10—13 cm. long. *Stem* slender, straight, 35—50 cm. high, with 1—2 short branches. *Leaves* 4—5, linear or linear-lanceolate, subfalcate or erect, 18—45 cm. long, 1·5—4 mm. wide, firm with the margins, mid-rib and 1 or 2 other veins slightly prominent. *Spike* fairly laxly 5—10-flowered, the rachis usually flexuose. *Bract* oblong, acute, 7—9 mm. long, pellucid, colourless or partly purplish, with 1 or 3 dark veins; *bracteoles* as long as bract, bicarinate, bidentate. *Flowers* actinomorphic, pale blue or violet-blue tinged with darker blue; *perianth tube* very short, cylindrical, 1—1·5 mm. long, included in bract; *lobes* equal, oblong or obovate-oblong, obtuse, about 1—1·2 cm. long, 5—7 mm. wide. *Stamens* arising at top of perianth tube, erect, symmetrically disposed; filaments 2 mm. long; anthers oblong, 5 mm. long, opening widely from base to apex along the sides. *Ovary* rotund, about 2 mm. long; style reaching to top of perianth tube, the branches involute-filiform, about 3 mm. long, stigmatic at the apex.

HOLOTYPE. *Grant* and *Theiler* 4931 in the Bolus Herbarium.

Flowering period. September—October.

SUTHERLAND. Near Quaggas Pass on road from Middlepost to Ceres, *Grant* and *Theiler* 4931 (BOL); Komsberg, flats, *Marloth* 9782 b (PRE).

The description has been drawn from the only two known collections of this very distinct species. It is most closely allied to *I. trifolia* but distinguished by the taller, more slender stem, longer narrower leaves and blue flowers with a very short perianth tube which is not more than 1·5 mm. long and is the shortest in the genus.

42. **I. trifolia** Lewis, Fl. Pl. S. Afr. 14: t. 543. 1934.

Corm ovoid or globose, 1·5—2 cm. diam.; tunics matted, of coarse somewhat ligneous fibres, the lower half of parallel vertical strands and upper half reticulate. *Stem* 15—30 cm. high, simple or with 1—2 short branches. *Basal sheaths* 2, 0·5—4·5 cm. long. *Leaves* 3 or 4, lanceolate, firm with more or less prominent cartilaginous margins and mid-rib, 6—16 cm. long, 0·6—1 cm. wide, the lowest usually falcate and others erect, arcuate or straight, the uppermost almost entirely sheathing. *Spike* laxly 5—9-flowered, the rachis flexuose. *Bract* ovate, obtuse, truncate or very shortly tridentate, 7—9 mm. long, pellucid, green at the base and pinkish mauve above; *bracteoles* bicarinate, bidentate. *Flowers* actinomorphic, deep pink or purplish pink, usually with a small inconspicuous purple stain in the middle; *perianth tube* filiform, 3—4 mm. long, not exserted from the bract; *lobes* connate for about 1 mm., oblong or obovate-oblong, obtuse, 1·4—2 cm. long, 0·7—1 cm. wide, patent. *Stamens* arising at top of perianth tube, symmetrically disposed; filaments 4—5 mm. long, occasionally connate at the base, purple; anthers yellow, 4—5 mm. long, linear-oblong, opening widely from base to apex along the sides. *Ovary* rotund, 2—3 mm. long; style reaching to base of anthers or shortly above, the branches 4—5 mm. long, filiform, straight or slightly curved, minutely ciliate and stigmatic at the apex.

HOLOTYPE. *Lewis*, NBG 2706/32 in the Bolus Herbarium.

Flats and hills in western mountain karoo vegetation.

Flowering period. September—October.

SUTHERLAND. Between Matjesfontein and Sutherland, *Hutchinson* 685 (BOL, K); top of Verlaten Kloof, Jakhals Valley, *Marloth* 9646 (PRE); Theronsrust, S. of Sutherland, c. 5,300 ft., *Acocks* 17798 (PRE).

LAINGSBURG. Tweedside, *Lewis*, NBG 2706/32 (BOL, K, PRE).

43. **I. curvata** Lewis sp. nov.

Cormus ovoideus vel subglobosus, 1·3—2·3 cm. diam., tunicis e fibris subrobustis reticulatis plerumque in collo 3—5 cm. longo productis, compositis. *Caulis* gracilis, firmus, plerumque valde flexuosus vel curvus, 15—25 cm. altus, simplex vel ramis 1—2 brevibus flexuosis. *Vaginae basales* 2, acutae, 3·5—7 cm. longae, aurantiaco-brunneae. *Folia* 3—5, linearia arcuata, 7—13 cm. longa, 2—4 mm. lata, firma vel subrigida nervo medio prominenti. *Spica* laxe 6—10-flora plerumque rachide flexuoso. *Bractea* oblonga vel oblongo-ovata obtusa vel acuta vel tridentata, 4—5 mm. longa, pellucida vel sine colore vel purpurina plerumque nervis fuscis 1 vel 3; *bracteolae* quam bractea aequilongae, bicarinatae bidentatae. *Flores* plerumque regulares, parvi rosei; *perianthii tubus* filiformis, 3—5 mm. longus; *segmenta* patentia oblonga obtusa subaequalia, 0·9—1·4 cm. longa, 4—8 mm. lata. *Stamina* ad apicem tubi perianthii orta, erecta, congruenter disposita, interdum postea aliquanto filamentis curvis et antheris reclinatis; filamenta 3—4 mm. longa; antherae oblongae subdidymae, 3·5—4 mm. longae, thecis apice obtusis, basin versus recurvis obtusis vel subacutis, a fundo ad apicem late dehiscentibus. *Ovarium* rotundum, circa 3 mm. longum; stylus fere ad medium filamentorum attingens, ramis involuto-cylindricis, falcatis vel recurvis, 2—3 mm. longis, retusis vel brevissime bifidis apice stigmatifero minute papillato.

Corm ovoid or subglobose, 1·3—2·3 cm. diam.; tunics of moderately coarse reticulate fibres, usually extending up in a neck 3—5 cm. long. *Stem* slender, firm, usually extremely flexuose or curved, 15—25 cm. high, simple or with 1—2 short flexuose branches. *Basal sheaths* 2, acute, 3·5—7 cm. long, orange-brown. *Leaves* 3—5, linear, arcuate, 7—13 cm. long, 2—4 mm. wide, firm or fairly rigid with the mid-rib prominent. *Spike* laxly 6—10-flowered, the rachis usually flexuose. *Bract* oblong or oblong-ovate, obtuse, acute or tridentate, 4—5 mm. long, pellucid, colourless or purplish, usually with 1 or 3 dark veins; *bracteoles* as long as bract, bicarinate, bidentate. *Flowers* usually actinomorphic, small, deep pink; *perianth tube* filiform, 3—5 mm. long; *lobes* patent, oblong, obtuse, subequal, 0·9—1·4 cm. long, 4—8 mm. wide. *Stamens* arising at top of perianth tube, erect, symmetrically disposed but sometimes the filaments becoming curved and anthers reclinate later; filaments 3—4 mm. long; anthers oblong, subdidymous, 3·5—4 mm. long, the cells obtuse at the apex and recurved and obtuse or subacute at the base, opening widely from base to apex. *Ovary* rotund, about 3 mm. long; style reaching nearly to middle of filaments, the branches involute-cylindrical, falcate or recurved, 2—3 mm. long, retuse or very shortly bifid and minutely papillate at the apex.

HOLOTYPE. *Lewis* 2532 in the South African Museum Herbarium, National Botanic Gardens, Kirstenbosch.

Hills and low slopes of mountains at 3,000—3,400 ft. altitude in the Calvinia Division.

Flowering period. September.

CALVINIA. Moordenaarspoort, near Agter Hantamsberg, 26—28 miles N.E. of Calvinia, *Lewis* 2532 (SAM); *Middlemost* 1778 (NBG);

4½ miles S.S.E. of Calvinia, *Acocks* 18504 (PRE); Akkerdam, slopes of Hantamsberg, *Acocks* 17718 (NBG, PRE).

This species is distinguished from *I. trifolia*, to which it is closely allied, by its more curved and flexuose stem, usually more numerous, narrower and strongly falcate leaves, shorter bracts and smaller flowers with shorter, broader and more curved style branches. The corm, with its fibrous neck, and the bright orange-brown basal leaf-sheaths, also serve to distinguish this species.

44. **I. scillaris** L. Sp. Pl. ed. 2. 1: 52. 1762; Burm. f. Prod. 1. 1768; Houtt. Nat. Hist. 12: t. 77. f. 2. 1780; Panzer, Pflanzensyst. 11: t. 77. f. 2. 1784; Red. Lil. t. 127. 1807. *I. scillaris* var. *latifolia* Ker, Bot. Mag. t. 542. 1801; DC. in Red. Lil. sub t. 127. *I. pentandra* L.f. Suppl. 92. 1781; Thunb. Diss. Ixia 18. 1783, Prod. 10. 1794 et Fl. Cap. ed. Schultes 63. 1823. *I. polystachya* var. Jacq. Coll. Suppl. 159. t. 2. f. 1. 1796. *I. reflexa* Andr. Bot. Rep. t. 14. 1798. *I. rotata* (Ker) Andr. Recens. 3. 1801. *Tritonia scillaris* (L.) Baker, Journ. Linn. Soc. Bot. 16: 163. 1877, Handbk. Irid. 191. 1892 et Fl. Cap. 6: 120. 1896; Lewis in Adamson & Salter Fl. Cap. Pen. 249. 1950. *Tritonixia scillaris* (L.) Klatt, Abh. Naturf. Ges. Halle 12: 357 et Erganz. 23. 1882; Dur. & Schinz, Consp. Fl. Afr. 5: 209. 1895. *Agretta pentandra* (L.) Eckl. Top. Verz. 23. 1827, *nomen nud. Hesperantha pentandra* Drege in herb. ex Baker, Journ. Linn. Soc. Bot. 16: 163.

Corm ovoid or subglobose, 1—2 cm. diam.; tunics of fairly coarse vertical confluent fibres, comose at the apex. *Stem* firm, usually moderately stout, straight or flexuose, 20—50 cm. high, 1—3 mm. diam., simple or with 1—3 long erect branches. *Basal sheaths* 1 or 2, colourless or brown at the apex, acute, 1·5—7 cm. long. *Leaves* 3—7, distichous, lanceolate or ensiform, subobtuse, acute or acuminate, the lowest often more or less falcate and others erect or suberect and straight or almost so, 7—25 cm. long, 0·5 —2·5 cm. wide (usually 1—2 cm.), firm and conspicuously 3-veined or softer in texture and not very conspicuously 4- or 5-veined. *Spike* long, laxly 7—25-flowered, the lower flowers up to 2 or even 3 cm. apart, the rachis straight or flexuose. *Bract* small, pellucid, colourless, pale pink or purplish, obovate, 3- or 5-dentate or cuspidate, 4—5 mm. long; *bracteoles* bicarinate, bicuspidate. *Flowers* slightly zygomorphic, pale to deep pink or magenta, occasionally white or mauve, usually with a small greenish stain in the middle, faintly fragrant; *perianth tube* filiform, 3—4 mm. long; *lobes* patent or reflexed, more or less equally disposed or the 3 upper closely placed with partly overlapping margins and 3 lower separated, equal or 3 inner 1—2 mm. wider than outer, oblong or obovate-oblong, slightly concave, sometimes subunguiculate, 0·8—1·6 cm. long, 5—8 mm. wide. *Stamens* arising at top of perianth tube; filaments flat, 3—4 mm. long, the 2 lower slightly twisted and sometimes directed towards the upper; anthers oblong, subdidymous, 3—4 mm. long, lightly attached near the base, reclinate and pendulous, not symmetrically disposed, sometimes more or less connivent at the base, extrorse, the cells obtuse at the apex, slightly recurved and acute at the base, opening by a narrow slit extending nearly to the apex. *Ovary* oblong-trigonal with rounded angles, about 2·5 mm. long; style reaching to top of perianth tube, the branches 2·5—3 mm. long, involute-cylindrical, slightly expanded and minutely papillate at the apex, recurved.

LECTOTYPE. Sheet 58·25 in the Linnaean Herbarium.

Clay or sandy soil on hills and mountain slopes up to 3,000 ft. in the coastal districts from Namaqualand to the Cape and in the Paarl, Somerset West and Caledon Divisions.

Flowering period. August—November.

NAMAQUALAND. Spektakel, *Esterhuysen* 5853 (BOL); *Barker* 1328 (NBG); 14 miles W. by S. of Springbok, *Acocks* 19439 (NBG, PRE); 10 miles W. of Springbok, *Barker* 6660 (NBG).

VANRHYNSDORP. Gifberg, *Barker* 9578 (NBG).

CLANWILLIAM. Olifants River Valley, *Steyn* 378, 516 (NBG); *Barker* 5758 (NBG); *Compton* 22769 (NBG); Clanwilliam, *Leipoldt* 221 (BOL, SAM); Elands Kloof, *Lewis* 1351 (SAM); *Leighton* 1254 (BOL); Brakfontein, *Ecklon* and *Zeyher* 243 (G, SAM); Citrusdal, *Barker* 3765 (NBG); 15—20 miles N. of Citrusdal, *Lewis* 1352 (SAM), 5233 (NBG); between Greys Pass and Clanwilliam, *Leipoldt* 3833 (BOL); Olifants River Mts., *Howes* 204 (K); *Schlechter* 5076 (Z); *Stokoe* (SAM); Olifants River Valley, Warm Baths to Modderfontein, *Stephens* 7087 (BM, K); Pakhuis, *Bolus* 9098 (BOL); *Esterhuysen* 3158 (BOL); *Lewis* (BOL); *Galpin* 11115 (K); *MacOwan* 3301 (SAM); *Leipoldt* 797 (SAM); *Bond* 614 (NBG); *Compton* 19962 (NBG); 10 miles N. of Clanwilliam, *Leighton* 1099 (BOL); *Compton* 17115 (NBG); *Lewis* 1353 (SAM); Nardouw Kloof, *Stokoe* (SAM); 20 miles S. of Clanwilliam, *Salter* 7494 (SAM); Nieuwoudt Pass, *Leighton* (BOL); between Witte Els Kloof and Lamberts Hoek Mt., *Pillans* 9172 (BOL, SAM); Zeekoe Vlei, *Schlechter* 8500 (BM, G, K).

PIKETBERG. *Drege* 8497 (P); top of Greys Pass, *Taylor* 960 (BOL); Pikeniers Kloof, *Loubser* 911 (NBG); between Berg River Valley and Clanwilliam, *Lewis* 1848 (SAM); Het Kruis, *Stephens* and *Glover* 8605 (BM, K); Piketberg Mt., *Barker* 7584 (BOL, NBG); Kapiteins Kloof Mt., 3,250 ft., *Pillans* 7806 (BOL); hills N.W. of Moutons Vley, *Pillans* 7277 (BOL).

MALMESBURY. Near Groene Kloof, *Thunberg* (UPS—type of *I.*

pentandra); *Bolus* 4006 (BM, BOL, SAM); Klipberg, between Laauws Kloof (near Groene Kloof) and Saldanha Bay, *Drege* (K, P); near Malmesbury, *Schlechter* 1678 (Z).

CAPE. Little Lions Head, *Salter* 333/18 (BM); Kanonberg, *Salter* 1728 (K); near Camps Bay, *MacOwan* 2234 (SAM), HNAA 274 (BM, BOL, G, K); *Dod* 1776 (BM); *Zeyher* 5035 (BOL, SAM); *Pappe* (K); *Barker* 3214 (NBG); *Cassidy* 38, 54 (NBG); *Letty* 233 (K); between Kloof Nek and Camps Bay, *Lewis* 969 (SAM); above Bakoven, *Barker* 3220 (BOL, NBG); Sea Point, *Wilms* 3710 (BM, K); Lions Head, *Bolus* 2826 (BM, BOL, K); *Heginbotham* 108 (NBG); Signal Hill, *Dummer* 523 (BM); Table Mt., *Mudd* 10 (K); *Ecklon* 9 b (BM, K, M), 536 (K); *Garside* 270 (K); *Drege* (P, SAM); Devils Peak, *Dod* 487 (K); *Bolus* 4006 (BOL, K); Cape Town, *Prior* (K); Orange Kloof, *Dod* 3502 (BOL, K); Wynberg Flats, Bowie 11 (BM).

PAARL. Paarl Mt., *Drege* (K, P).

SOMERSET WEST. Sir Lowrys Pass, *Schlechter* 5370 (BM, BOL, G, K); *Compton* 16542 (BOL, NBG); Helderberg, *Parker* 4360 (BOL, NBG); Hottentots Holland, *Prior* (K).

CALEDON. Bot River Valley near Hawston, *Wilman* 768 (BOL).

WITHOUT LOCALITY. *Linnaeus* (LINN, sheet 58·25); *Burmann* (G); *Thunberg* (G); *Drege* (BM, G); *Jussieu* 3598 (P); *Lamarck* (P); *Percheron* 88 in Herb. Lamarck (P); *Burchell* (K); *Forsyth* (K); *Roxburg* (BM, G); *Pappe* (K, SAM); *Prior* (BM); *Bowie* 4 (BM); *Oldenburg* 570, 704 (BM); *Sparrman* (LINN).

There are two distinct forms of this species, merging into each other through intermediates. In the Clanwilliam, Piketberg and Caledon Divisions the plants are fairly tall and robust with a simple or branched stem up to 50 cm. high, three or four fairly firm, conspicuously three-nerved leaves, the lowest usually falcate, and a long lax spike with the lower flowers up to 2 or 3 cm. apart. A smaller more branched form occurs in the Piketberg, Malmesbury, Cape, Paarl and Somerset West Divisions. This usually flowers a few weeks later and has four to seven leaves, narrower, more acute, somewhat softer in texture and less conspicuously three- to five-veined, also a shorter spike with slightly smaller and more regular flowers, the lower ones not more than 1·5 cm. apart. Intermediates with three to five leaves, which cannot definitely be placed in one or the other of these forms, occur in Namaqualand and in the vicinity of Mamre and Darling in the Malmesbury Division, and some of the collections from the latter area exactly match the plant in the Linnaean Herbarium which is chosen as the lectotype of the species.

In the Linnaean Herbarium there are three sheets named *I. pentandra*, 58.25, 58.26 and 58.27—the first erroneously listed as *I. pectinata* by Mr.

Savage on page 7 of his Catalogue of the Linnaean Herbarium. On sheet 58.26 there is a flowerless plant of the smaller form, collected by Sparrman, and on sheet 58.27, marked "CBS. crescit in Belgio", the top of an inflorescence of the same form. Neither can be the type but the plant on sheet 58.25 agrees with the description, and as the name *I. scillaris* was written on the sheet by Linnaeus it is possible that it might have been the type. This name was deleted by the younger Linnaeus, who named it *I. pentandra*, but the original name was confirmed by J. E. Smith who added "*scillaris* Herb. B. & L. Sp. Pl." The plant is tall, with a simple, comparatively stout stem, an elongated lax spike, and five leaves, the lower ones ensiform and conspicuously three-veined.

Owing to some confusion, which research into the Linnaean correspondence and early history of the herbarium might elucidate, the younger Linnaeus applied the name *I. scillaris* to a species of *Geissorrhiza* with very narrow filiform, subquadrangular or subterete leaves, and described as a new species a specimen of *I. scillaris* collected by Thunberg, naming it *I. pentandra* on account of its unusual pentandrous flowers (the type is in Thunberg's Herbarium). Sheet 58.14 in the Linnaean Herbarium, which contains three specimens of *Geissorrhiza juncea* collected by Sparrman (no. 17), is named *Ixia scillaris* by Linnaeus f., with a note by J. E. Smith "Thunb. Diss. n. 14 nec Linn". According to Mr. Savage's Catalogue, p. 7, *Sparrman* No. 17 was named "*Ixia alba nutans*".

Due to the above misidentification by the younger Linnaeus, the plants in Thunberg's Herbarium named *I. scillaris*, and described by him under this name, are partly *Geissorrhiza juncea* and partly another species of *Geissorrhiza*, neither of which in any way agrees with the description of *I. scillaris* given by Linnaeus, nor resembles the specimen on sheet 58.25 in his herbarium.

Linnaeus gave the following brief description of the species in 1762: "*Ixia* foliis ensiformibus striatis, spica elongata. Flores violacei ut in *Scilla amoena*, antheris flavis, alterni, remoti." In 1767, in the Syst. Nat. 12, p. 75, he added the words "bulbus deorsum imbricatus". The references to the colour of the flowers and to the corm are puzzling as they do not seem to apply to *Ixia scillaris* L. With regard to the former, I can only think that Ker was right in supposing the plant to have been described from a dried specimen. The species was illustrated as *I. scillaris* var. *latifolia* in the Botanical Magazine in 1801, t. 542, where Ker commented on the colour as follows: "This is certainly Linnaeus's plant, and received its trivial name from a supposed resemblance to *Scilla amoena*, a proof that he described it from a dried subject, in which state it certainly affords different ideas of resemblance, than when seen in a living one, especially in colour, which then becomes nearly violet, but is distinct from the *I. scillaris* of Thunberg, that being nearly allied to *I. secunda*" (i. e. *Geissorrhiza*).

In *I. scillaris*, as in a few other species, the corm tunics are very often composed of imbricating layers of fairly coarse vertical confluent fibres, to which the description "bulbus deorsum imbricatus" might perhaps apply. There is no corm on the specimen in the Linnaean Herbarium.

The difference between *I. scillaris* and other species of the subgenus is discussed in the introduction to this paper, under the Subgenus Dichone.

Var. **subundulata** Lewis var. nov.

Plantae quam var. *scillaris* minores et graciliores, foliorum marginibus leviter vel perspicue undulatis.

Caulis simplex vel ramosus, gracilis vel subrobustus, 20—45 cm. altus. *Folia* 3—4, lanceolata vel ensiformia, 5—20 cm. longa, 0·3—1·5 cm. lata, subobtusa vel acuta, infimum plerumque falcatum, mollia, marginibus plus minusve undulatis et nervo medio subprominente. *Spica* laxe 5—20-flora. *Flores* albi vel rosei ad medium macula punicea notati, var. *scillare* similes.

Plants smaller and more slender than in var. *scillaris*, the leaves with slightly to distinctly undulate margins.

Stem simple or branched, slender to moderately stout, 20—45 cm. high. *Leaves* 3—4, lanceolate or ensiform, 5—20 cm. long, 0·3—1·5 cm. wide, subobtuse or acute, the lowest usually falcate, soft with more or less undulate margins and the mid-rib slightly prominent. *Spike* laxly 5—20-flowered. *Flowers* white to pink with a small deep pink stain in the middle, as in var. *scillaris*.

HOLOTYPE. *Barker* 4727 in the Compton Herbarium, Kirstenbosch.

Flats and lower slopes of mountains, usually in clay soil, in the Clanwilliam and Piketberg Divisions.

Flowering period. August—September.

CLANWILLIAM. Klipfonteinrand, *Barker* 4727 (BOL, NBG); Brandewyn Rivier, *Barker* 1327 (NBG); *Esterhuysen* 5805 (BOL); near Pakhuis on road to Wupperthal, *Leipoldt* (BOL 20775, K, SAM).

PIKETBERG. Foot of Piketberg Mt., *Schlechter* 5218 (BM, BOL, G, K, SAM); De Hoek, near Piketberg, *Barker* 2560, 5764 (NBG), 4671 (BOL, NBG); *Lewis* 1849 (SAM); Piketberg, *Guthrie* 2700 (NBG); Kapiteins Kloof, *Pillans* 7713 (BOL).

WITHOUT LOCALITY. *Jussieu* 3619 (P); *Thunberg* (UPS—*I. crispa* sheet b).

This variety has generally been confused with *I. crispa* but is distinguished by its wider, less undulate leaves and slightly zygomorphic flowers with patent or reflexed lobes and longer pendulous anthers.

Thunberg gave two localities for *I. crispa* in his Flora Capensis, Roodesand hills and near Piketberg. The first of the two sheets named *I. crispa* in his herbarium is the plant figured by him and the same as his No. 313 in the Linnaean Herbarium which is the type of *I. crispa* L. f., while the second is the variety of *I. scillaris* described above. The first he probably collected on the Roodesand hills in the Tulbagh Division, where *I. crispa* is known to occur. The second has been found on the lower southern slopes of the Piketberg Mt., in the same locality and flowering at the same time as *I. lancea* Thunb. (= *Tritonia lancea* (Thunb.) N. E. Br.), and was probably collected by Thunberg in this area.

SPECIES EXCLUDED

The following species have been excluded for various reasons, the majority owing to insufficient knowledge concerning them:

I. alba Eckl. Top. Verz. 27. 1827, *nomen nudum.* This is a later homonym of *I. alba* L. (= *Sparaxis* sp.). See note under *I. odorata* var. *hesperanthoides.*

I. ambigua Salisb. Prod. 39. 1796. No specimen has been seen but this is evidently a *Tritonia* as are the five previous species referred to in the description.

I. amoena Salisb. l. c. 35. No specimen has been seen and the species cannot be determined from the description. It has been cited as a synonym of *I. maculata.*

I. amoena Link. Enum. Pl. Hort. Berol. 1: 52. 1821. From the description it is very unlikely that *I. amoena* Link., a later homonym of *I. amoena* Salisb., is an *Ixia.* It is possibly *Tritonia rubro-lucens* Foster (syn. *T. rosea* Klatt).

I. antholyzaeformis Lam. Encyc. 3: 334. 1789 et Illustr. 1: 109. 1791. It is evident from the description that this is not an *Ixia.* There is no specimen in Lamarck's herbarium, only a rough drawing which I was unable to identify.

I. arcuata Burm. f. Prod. Fl. Cap. 2. 1768. There is no specimen in Burmann's herbarium and it is not possible to determine the species from the description.

I. azurea Grey, Hardy Bulbs 1: 283. 1937, *nomen illeg. Lapeyrousia azurea* Eckl., cited with a query by the author, is a large-flowered variety of *Lapeirousia corymbosa* (Fl. Cap. 6: 90), and cannot be the plant he described. The name is a later homonym of *Ixia azurea* Banks ex Ker, Bot. Mag. t. 598.

I. bicolorata Klatt, Abh. Naturf. Ges. Halle 12: 396 et Erganz. 62. 1882. The type has not been seen and is presumed to have been destroyed during the last war. From the description it might be the yellow variety of *I. polystachya* L. or *I. dubia* Vent. (see notes under these species).

I. bifaria Moench, Meth. Suppl. 213. 1802. No specimen has been seen but it is very unlikely that the plant described is an *Ixia*. It is possibly *Lapeirousia laxa* (Thunb.) N. E. Br.

I. bimaculata Schrank, Denkschr. Bot. Ges. Regensb. 2: 182. 1822. No specimen has been seen. From the description it does not seem to be an *Ixia*—it might perhaps be a form of *Sparaxis tricolor*.

I. coccinea Eckl. Top. Verz. 24. This is probably *I. campanulata* Houtt. (syn *I. coccinea* Thunb., partly). Ecklon cited Brehm as the collector and there are specimens of *I. campanulata* collected by him in the herbaria of the Botanic Gardens, Brussels, and Botanische Staatssammlung, Munich, named *Gladiolus coccineus* Schrank.

I. concinna Salisb. l. c. 37. No specimen has been seen and the species cannot be determined from the description.

I. conspicua Salisb. l. c. 36. This might be *I. dubia* Vent. but no specimen has been seen and the description is inadequate.

I. dinteri Schinz, Bull. Herb. Boiss. 20: 14. 1900. In 1941 Foster suggested that this was a *Lapeirousia* (Contrib. Grey Herb. No. 135, 7), and this was confirmed in July 1960 in the following note received from Mrs. A. A. Mauve, National Herbarium, Pretoria: "Soelch of Munich in a MS. Liliales of S.W.A. makes *I. dinteri* a synonym of *Lapeirousia coerulea* Schinz".

I. fallax Salisb. l. c. 34. No specimen has been seen and the species cannot be determined from the description.

I. flabellularis Vahl, Enum. 2: 67. 1806. This has been cited as a synonym of *Tritonia flava* (Ait.) Ker and from the description it is probably correct. The type has not been seen.

I. flava Hornem. Hort. Hafn. Suppl. 5. 1815. The name is a later homonym of *I. flava* Lam. (= *Romulea bulbocodioides*). *I. flava* Hornem. has been cited as a synonym of *I. maculata* L. but this cannot be confirmed as no specimen has been seen and the description is inadequate. *I. flava* Eckl. Top. Verz. 25, a *nomen nudum*, is probably the same as *I. flava* Hornem.

I. fugax Salisb. l. c. 34. The preceding species referred to in the description is *Romulea columnae* and it is evident from the description that this must also be a species of *Romulea*.

I. geminiflora Schrank, Denks. Bot. Ges. Regensb. 2: 188. From the description it is doubtful if this is an *Ixia*. No specimen has been seen.

I. hexandra Schrank, l. c. 185. This is *Cyanella lutea* L. f. Specimens of *C. lutea*, named *I. hexandra*, in the herbaria of the Botanic Gardens, Brussels, and the Botanische Staatssammlung, Munich, collected by

Brehm near Cape Town, agree very well with the detailed description given by Schrank.

I. lineata Salisb. l. c. 35. No specimen has been seen and it is not possible to determine the species from the description.

I. minima Schrank, l. c. 179. From the description it is very unlikely that this is an *Ixia*. It is possibly *Pauridia minuta* (L. f.) Schinz.

I. mutabilis Salisb. l. c. 34. No specimen has been seen and it is not possible to determine the species from the description.

I. ochracea Eckl. l. c. 25, *nomen nudum.*

I. pallide flavens Eckl. l. c. 25. The identity of this species is uncertain. The name has been cited as a synonym of *I. curta* Andr. and *I. polystachya* L. In the Delessert Herbarium, Geneva, *Ecklon* 269, named *I. pallide-flava* Eckl., is *I. maculata* L.

I. propinqua Salisb. l. c. 38. No specimen has been seen. The brief description suggests that the plant is a *Tritonia* rather than an *Ixia.*

I. punicea Eckl. l. c. 24, *nomen nudum.* The name is a later homonym of *I. punicea* Jacq. (= *Babiana villosa* (Ait.) Ker).

I. reticularis Salisb. l. c. 37. No specimen has been seen and it is not possible to determine the species from the description.

I. socialis Salisb. l. c. 35. No specimen has been seen and the species is not known.

I. sordida Hornem. Hort. Hafn. Suppl. 6. No specimen has been seen but from the short description and reference to *I. monantha* De la R. (= *Sparaxis monanthos* (De la R.) N. E. Br.), this is probably a *Sparaxis.*

I. sprengeliana Schultes, Mant. 1: 282. 1822. (= *I. punicea* Spreng. Neue Entdeck. 1: 254. 1820; non Jacq. 1786—93). No specimen has been seen but from the description it is possible that this is a form of *I. latifolia* De la R. It has been cited as a synonym of *I. patens* Ait.

I. stellaris Hill, Syst. Veg. 10: 3. 1765. No specimen has been seen and it is not possible to determine the species from the description.

I. striata Vahl, Enum. 2: 65. Baker cited this as a synonym of *I. scariosa* Thunb. The type has not been seen but from the description it might perhaps be a form or variety of *I. latifolia* De la R (syn. *I. scariosa* Thunb.).

I. tardiflora Salisb. 1. c. 38. No specimen has been seen and it is not possible to determine the species from the description. It might perhaps be a *Tritonia.*

I. tenuifolia Vahl, 1. c. 62. The type has not been seen and the identity of the species is uncertain. In the Natural History Museum Herbarium, Stockholm, specimens of *I. framesii* L. Bolus and *I. latifolia* De la R. var. *angustifolia* Lewis are named *I. tenuifolia* Vahl by Klatt, but it is doubtful if either is correct. The description suggests a species of *Tritonia* rather than *Ixia.*

I. venosa (Willd) Link. Enum. Pl. Hort. Berol. 1: 51. 1821. The type has not been seen but from the description it is fairly certain that this is a *Tritonia*, possibly *T. lineata*.

GEOGRAPHICAL DISTRIBUTION

The genus is endemic to the Cape of Good Hope and its distribution within this area is characteristic of members of the Cape Flora, with the greatest concentration of species in the south-western districts. The highest number of species is found in the Caledon Division, where fifteen have been recorded. There are fourteen in the Paarl—Wellington, eleven or twelve in the adjoining Worcester, Stellenbosch, Tulbagh and Malmesbury Divisions, as well as Piketberg, and in the Clanwilliam Division thirteen. From Clanwilliam there is a sharp decrease northwards to Namaqualand and also eastwards through the more arid districts of Calvinia and Sutherland to Fraserburg, with only one species in the last. There is also a marked decrease from Caledon eastwards and only one species, *I. orientalis*, occurs in the coastal districts from Knysna to Bathurst, the latter the most easterly record for the genus. One species, *I. trichorriza*, described from Griqualand East, has since been found to belong to the genus *Dierama*, to which it was transferred by Dr. N. E. Brown in 1929.

The numbers of species recorded from the various magisterial divisions are given in the accompanying table and shown on the map. In the table the total number of species in each division is given in the column on the left, followed in the next three columns by the number in each of the three sections of the subgenus *Ixia*, and on the right those in the subgenus *Dichone*.

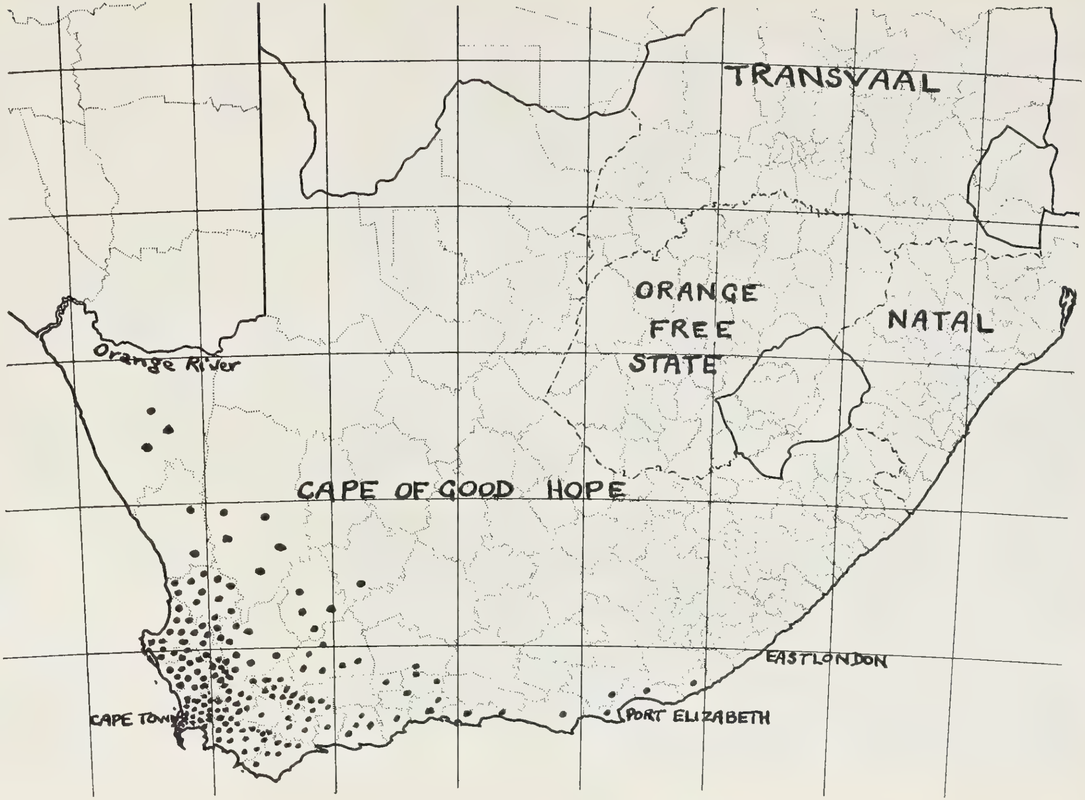
An analysis of these figures reveals that the section *Ixia*, with the largest number of species (18), has the most limited distribution, being almost entirely confined to the south-western districts, with the greatest concentration in Tulbagh and Paarl—Wellington, and only one species in Ceres and two in the Montagu Division. The small section *Hyalis*, with five species, has a very similar distribution except that the largest number of species occurs in the Caledon Division and one of them extends to Laingsburg and Ladismith. Section *Morphixia*, with thirteen species, is the most widely distributed, having one to five species in each of the divisions and its principal area of concentration in the Clanwilliam, Ceres and Worcester Divisions.

Five of the eight species in subgenus *Dichone* occur in the Caledon Division and three in Paarl—Wellington, but apart from this the widespread distribution of this comparatively small group is most like that of section *Morphixia,* with species occurring in the dry regions and those with a fairly high average rainfall. One of them, *I. scillaris,* occurs through the coastal districts from Namaqualand to Caledon.

There are about seven local endemics in the section *Ixia,* e.g. *I. viridiflora, I. vinacea, I. purpureorosea, I. stolonifera, I. curta* and *I. gloriosa,* and only one to three in each of the other sections and the subgenus *Dichone,* viz. *I. brunneobractea, I. framesii* and *I. cochlearis* in *Morphixia, I. spendida* in *Hyalis* and *I. curvata* and *I. trinervata* in *Dichone.* Four species in section *Morphixia* are extremely widespread, namely *I. orientalis, I. capillaris, I. latifolia* and *I. rapunculoides*—in each of the last two I have distinguished about six local varieties.

The section *Morphixia* I consider to be the most primitive in the genus. A few of the species in this group with more or less campanulate flowers,

		Subgenus IXIA			Subgenus DICHONE
	Total for Genus (44 species)	Section Morphixia (13 species)	Section Ixia (18 species)	Section Hyalis (5 species)	(8 species)
Namaqualand	3	2	–	–	1
Calvinia	5	4	–	–	1
Sutherland	4	2	–	–	2
Fraserburg	1	1	–	–	–
Vanrhynsdorp	2	1	–	–	1
Clanwilliam	13	5	5	2	1
Piketberg	11	3	4	2	2
Ceres	7	5	1	1	–
Tulbagh	12	2	8	1	1
Worcester	11	5	4	1	1
Hopefield	7	1	5	1	–
Malmesbury	11	3	5	1	2
Bellville	5	2	2	1	–
Cape	7	1	4	1	1
Paarl—Wellington	14	4	7	–	3
Stellenbosch—Somerset West	11	4	5	–	2
Caledon	15	3	4	3	5
Bredasdorp	6	1	1	2	2
Robertson	1	1	–	–	–
Montagu	8	4	2	1	1
Swellendam	8	4	2	1	1
Riversdale	4	2	1	–	1
Ladismith	3	2	–	1	–
Laingsburg	6	4	–	1	1
Mossel Bay	1	1	–	–	–
George	2	1	–	–	1
Oudtshoorn	3	2	–	–	1
Prince Albert	2	1	–	–	1
Knysna—Bathurst (coastal districts)	1	1	–	–	–



Map showing distribution of IXIA in South Africa.

such as *I. capillaris* and *I. rapunculoides*, bear a close resemblance to the genus *Dierama* and in a previous paper on the Iridaceae I have expressed the view that *Ixia* has a close phylogenetic affinity with that genus (Ann. S. Afr. Mus. vol. 40, pp. 68—72, 88). As far as is known all except one species of *Dierama* have evergreen leaves, which in my opinion indicates that it is more primitive than the geophytic genus *Ixia* with its deciduous aerial leaves, and it has an entirely different distribution, extending from Tropical Africa through the Transvaal, Orange Free State, Natal and eastern Cape Province to Humansdorp. *Ixia*, on the other hand, is confined to the western Cape Province with only one species extending along the south-east coast as far as Bathurst. It appears to me that *Ixia* may well have evolved from *Dierama* due to more arid conditions on the inland side of the mountain ranges of the west and south-western Cape. It is on the borders of this area that the largest number of the more primitive species occur, while the greatest area of development of the recent species in the section *Ixia* is on the western side of these mountain ranges and on the coastal plains.

It is of interest to note that *Geissorrhiza*, a genus fairly closely allied to *Ixia* but with a different type of corm and bract, has a limited distribution very similar to that of *Ixia*, while the very closely allied genus *Hesperantha* is well represented not only in the Western Cape Province but also in the eastern parts, Natal, the Transvaal, and extends into Tropical Africa. The theory that *Ixia* has evolved from a genus with a much wider distribution extending into Tropical Africa would be in accordance with the view put forward by Dr. M. R. Levyns that the Cape Flora originated somewhere in Tropical Africa and migrated southwards (S. Afr. Journ. Science Vol. 49, pp. 155—164 (1952)).

APPENDIX

To facilitate reference to changes which have been made in connection with a large number of species, the following list of names published under IXIA in the first volume and supplements of the Kew Index has been compiled, and an asterisk used to denote those which have been changed since they were first catalogued. The names placed within brackets are of species which are not of South African origin and belong to genera other than *Ixia*.

abbreviata Houtt. Handleid. 12: 41. t. 78. f. 3 = I. maculata L.
(*acuta* Bartr. Fl. N. Am. 1: 76 = Nemastylis geminiflora).
**acuta* Licht. ex Roem. & Schult. Syst. 1: 383 = Hesperantha acuta (Licht.) Ker.
africana Hornem. Cat. Hort. Havn. 68; ex Roem. & Schult. Syst. 1: 424 = Babiana rubrocyanea (Jacq.) Ker.
**africana* L. Sp. Pl. 36 = Aristea africana (L.) Hoffmnsg.
alba Eckl. Top. Verz. 27. Nomen nudum. See excluded species.
alba L. Syst. ed. 10. 862 = Sparaxis bulbifera (L.) Ker.
alboflavens Eckl. l. c. 27. Nomen nudum. = Ixia conferta Foster var. ochroleuca (Ker) Lewis.
**alopecuroides* L. f. Suppl. 92 = Micranthus alopecuroides (L. f.) Eckl.
ambigua Salisb. Prod. 39. See excluded species.
(*americana* Aubl. Pl. Gui. 1: 33 = Eleuthrine plicata).
(*americana* Sessé & Moc. Pl. N. Hispan. ed. 1. 11. Not known).
amoena Link. Enum. Hort. Berol. 1: 52. See excluded species.
amoena Salisb. l. c. 35. See excluded species.
anemonaeflora (DC in) Red. Lil. t. 85 = Sparaxis bulbifera (L.) Ker.
**anemonaeflora* Jacq. Ic. t. 273; Coll. Suppl. 10 = I. campanulata Houtt.
angusta Jacq. Ic. t. 279 = Hesperantha angusta (Jacq.) Ker.
**angusta* L. Bolus, S. Afr. Gard. 21: 367 = I. patens Ait.
angustifolia Eckl. l. c. 25. Nomen nudum. = I. dubia Vent.
angustifolia Klatt in Dur. & Schinz, Consp. Fl. Afr. 5: 182 = I. monadelpha De la R.
**antholyzaeformis* Lam. Encyc. 3: 334. Not Ixia. See excluded species.
arcuata Burm. f. Fl. Cap. Prod. 2. See excluded species.
**aristata* Ker, Bot. Mag. t. 589 = I. longituba N. E. Br.
aristata Schneev. Ic. t. 32 = I. patens Ait.
aristata Ait. Hort. Kew. 1: 57 = Sparaxis grandiflora (De la R.) Ker.
**aristata* Thunb. Diss. Ixia 14 = I. campanulata Houtt.
**aulica* Ait. Hort. Kew. 1: 57 = I. latifolia De la R.
**aurantiaca* Klatt, Abh. Naturf. Ges. Halle 12: 397 = I. polystachya L. var. lutea (Ker) Lewis.
(*autumnalis* Salisb. l. c. 33 = Crocus autumnalis).

**avellana* Foster, Contrib. Gray Herb. No. 114. 47 (1936) = I. odorata Ker ?

azurea Banks ex Ker, Bot. Mag. t. 598 = Geissorrhiza rochensis (Ker) Ker.

azurea Grey, Hardy Bulbs 1: 283 (1937), sine descr. lat. Nomen illegitimum.

bellendenii Foster, Contrib. Gray Herb. No. 114. 47. Nom. nov. p. 155

**bicolor* Ker, Bot. Mag. t. 584 = Synnotia villosa (Burm. f.) N. E. Br.

**bicolor* Thunb. in Hoffm. Phytogr. Blaett. 1 (1803) = Geissorrhiza bicolor (Thunb.) N. E. Br.

bicolorata Klatt, Abh. Naturf. Ges. Halle 12: 396. See excluded species.

bifaria Moench. Meth. Suppl. 213. See excluded species.

bimaculata Schrank, Denkschr. Bot. Ges. Regensb. 11: 182. See excluded species.

**bolusii* Lewis, Journ. S. Afr. Bot. 4: 10 (1938) = I. paucifolia Lewis.

**brevifolia* Baker, Handbk. Irid. 165 = Gladiolus subaphyllus N. E. Br.

bulbifera L. Cent. Pl. 2: 4; Amoen. Acad. 4: 300 = Sparaxis bulbifera (L.) Ker.

bulbocodiodes De la R. Descr. Pl. Nov. 19 = Romulea bulbocodioides (De la R.) Baker.

bulbocodium Lam. Encyc. 3: 335 = Romulea rosea (L.) Eckl.

(*bulbocodium* L. Sp. Pl. ed. 2. 51 = Romulea bulbocodium).

(*bulbocodium* Sibth. & Sm. Fl. Graec. 1: 26. t. 36 = Romulea linaresii).

**bulbocodium* Thunb. Diss. Ixia 6 = Romulea rosea (L.) Eckl.

**burrmanni* F. G. Dietr. Vollst. Lexik. Gaertn. Nachtr. 4: 253 (1818) = Hesperantha spicata (Burm. f.) N. E. Br.

caerulescens Eckl. Top. Verz. 26. Nomen nudum.

**campanulata* Banks ex Roem. & Schult. Syst. 1: 391 = I. campanulata Houtt.

campanulata Houtt. Handl. 12: 42. t. 78. f. 4. p. 127

campanulata Lam. Illustr. 1: 109 (1791) = Romulea sp.

campanuloides Eckl. Top. Verz. 26. Nomen nudum.

cana Eckl. l. c. = I. viridiflora hybrid.

candida Eckl. l. c. 27 = I. campanulata Houtt.

**candida* (Delile in) Red. Lil. 8: t. 426 = I. patens Ait.

capillaris L. f. Suppl. 92 (1781); Thunb. Diss. Ixia 12. t. 2. f. 2.

capitata Andr. Bot. Rep. t. 50 (1797) = I. maculata L.

(*carmosina* Hort. ex Hoeven & De Vriese, Tijdschr. 8: 164. Not known).

**cartilaginea* Lam. Encyc. 3: 340 = I. monadelpha De la R.

**caryophyllacea* Burm. f. Fl. Cap. Prod. 1 = Freesia caryophyllacea (Burm. f.) N. E. Br.

**cepacea* (DC. in) Red. Lil. t. 96 = Micranthus tubulosus (Burm. f.) N. E. Br.

(*chinensis* L. Sp. Pl. 36 = Belamcanda chinensis).

chloroleuca Jacq. Ic. t. 272; Coll. 4: 180 = Romulea chloroleuca (Jacq.) Baker.

ciliaris Salisb. ex Ker, Bot. Mag. sub. t. 549. Nomen nudum.

cinnamomea Andr. Bot. Rep. t. 44 = Hesperantha falcata (L. f.) Ker.

**cinnamomea* L. f. Suppl. 92 (1781); Thunb. Diss. Ix. 10 = Hesperantha spicata (Burm. f.) N. E. Br. var. cinnamomea (L. f.) Foster.

coccinea Eckl. Top. Verz. 24. Nomen nudum. See excluded species.

**coccinea* Thunb. Fl. Cap. 1: 241 = I. campanulata Houtt. and I. patens Ait.

8. cochlearis Lewis, Fl. Pl. Afr. t. 969 (1946). p. 9

*(*coelestina* Bartr. ex Willd. Sp. Pl. 1: 200; vide Foster, Contrib. Gray Herb. No. 155. 15 (1945) = Sphenostigma coelestina).

**coerulescens* Pers. Syn. 1: 48 = Babiana villosula (Gmel.) Ker ex Steud.

**columellaris* Ker, Bot. Mag. t. 630 = I. monadelpha De la R.

(*columnae* Schult. Mant. 1: 278 = Romulea columnae).

columnaris Salisb. Prod. 36 = I. monadelpha De la R.

concinna Salisb. l. c. See excluded species.

concolor Salisb. l. c. = I. campanulata Houtt.

10. conferta Foster, Contrib. Gray Herb. No. 114. 47 (= *I. ovata* (Andr.) Sweet). p. [illegible]

conica Salisb. l. c. = I. maculata L.

conspicua Salisb. l. c. See excluded species.

cooperi Baker, Handbk. Irid. 166 = Tritonia cooperi (Baker) Klatt.

corymbosa L. Cent. Pl. 2: 4; Amoen. Acad. 4: 300 = Lapeirousia corymbosa (L.) Ker.

**crateroides* Ker, Bot. Mag. t. 594 (1802) = I. campanulata Houtt.

38. crispa L. f. Suppl. 91.

crispifolia Andr. Bot. Rep. t. 35 = Lapeirousia corymbosa (L.) Ker.

crocata Red. Lil. t. 335 = Tritonia miniata (Jacq.) Ker.

crocata L. Sp. Pl. ed. 2. 52 = Tritonia crocata (L.) Ker.

**crocea* Thunb. Fl. Cap. 1: 218 = Romulea triflora (Burm. f.) N. E. Br.

cruciata Jacq. Coll. Supp. 16 = Romulea cruciata (Jacq.) Baker.

[illegible] curta Andr. Bot. Rep. t. 564. p. 145

**cyanea* Pers. Syn. 1: 49 = Babiana rubrocyanea (Jacq.) Ker.

densiflora Klatt, Abh. Naturf. Ges. Halle 12: 397 = I. patens Ait.

deusta Ait. Hort. Kew. 1: 60 = Tritonia deusta (Ait.) Ker.

**dinteri* Schinz, Mem. Herb. Boiss. No. 20: 14 = Lapeirousia. See excluded species.

**dispar* N. E. Br. Kew Bull. 1929, 134 = I. patens Ait.

disticha Lam. Encyc. 3: 333 = Witsenia maura (L.) Thunb.

dubia Eckl. Top. Verz. 26. Nomen nudum.

28. dubia Vent. Choix 10. p. 134

**duckittiae* L. Bolus, S. Afr. Gard. 21: 281—2 = I. maculata L.
**elegans* (Regel) N. E. Br. Journ. Linn. Soc. Bot. 48: 43 (1928) = I. polystachya L.
**elliptica* Thunb. Fl. Cap. 1: 244 = Lapeirousia juncea (L. f.) Pourr.
(*elongata* Vahl, Enum. 2: 51 = Romulea elongata).
emarginata Lam. Encyc. 3: 342 = Lapeirousia juncea (L. f.) Pourr.
(*ensifolia* Noronha in Verh. Batav. Gen. V (1790) = Pardanthus chinensis).
erecta Berg. Descr. Pl. Cap. 5 (1767) = I. polystachya L.
erecta Jacq. Hort. Schoenbr. t. 18 (1797) = I. polystachya L. var. lutea (Ker) Lewis.
erecta Thunb. Diss. Ixia 16 (1783) = *I. avellana* Foster = odorata Ker?
**erosa* Salisb. Prod. 36 = Geissorrhiza erosa (Salisb.) Foster.
(*europaea* Pers. Syn. 1: 46 = *Trichonema bulbocodium*).
**excisa* L. f. Suppl. 92; Thunb. Diss. Ixia 19 = Geissorrhiza ovata (Burm. f.) Asch. & Graebn.
fabricii De la R. Descr. Pl. Nov. 18 = Laperousia anceps Ker.
falcata Thunb. Diss. Ixia 19 = Hesperantha falcata (L. f.) Ker, partly.
fallax Salisb. Prod. 34. See excluded species.
fastigiata Lam. Encyc. 3: 337 = Lapeirousia corymbosa (L.) Ker var.
fenestrata Jacq. Coll. 3: 270 = Tritonia hyalina (L. f.) Baker.
**fenestrata* Thunb. in Hoffmn. Phyt. Blaett. 4 (1803) = Tritonia laxifolia Benth.
**filifolia* Red. Lil. t. 251. f. 2 = Romulea triflora (Burm. f.) N. E. Br.
filiformis Vent. Jard. Cels. t. 48 (1800) = I. patens Ait.
fimbriata Lam. Encyc. 3: 339 = Sparaxis grandiflora (D la R.) Ker.
fistulosa Andr. Bot. Rep. t. 59 (1799) = Hesperantha radiata (Jacq.) Ker.
**fistulosa* Ker, Bot. Mag. t. 523 = Micranthus tubulosus (Burm. f.) N. E. Br.
**flabellifolia* De la R. Descr. Pl. Nov. 24 = Tritonia flabellifolia (De la R.) Lewis.
**flabelliformis* Salisb. Prod. 37 = Babiana purpurea (Jacq.) Ker.
flabellularis Vahl, Enum. 2: 67 = Tritonia flava (Ait.) Ker.
flaccida Salisb. l. c. 35 = I. patens Ait.
flava Hornem. Hort. Hafn. Suppl. 5 (1815). See excluded species.
flava Lam. Illustr. 1: 109 = Romulea bulbocodioides (De la R.) Baker.
**flavescens* Eckl. Top. Verz. 26. Nomen nudum. = I. odorata Ker.
flavovirens Eckl. l. c. Nomen nudum.
flexuosa Ker, Bot. Mag. t. 127 = *I. hybrida* Ker=*I.* polystachya hybrid?
flexuosa L. Sp. Pl. ed. 2, 51. P 11c
**fragrans* Jacq. Coll. Suppl. 9 = Sparaxis sp.
framesii L. Bolus, S. Afr. Gard. 21: 367, 369. p. 91

fruticosa L. f. Suppl. 93; Thunb. Diss. Ixia 5. t. 1. f. 3 = Nivenia fruticosa (L. f.) Baker.

12 fucata Ker, Bot. Mag. t. 1379. p. 9

**fugacissima* L. f. Suppl. 94 = Galaxia fugacissima (L. f.) Druce.

fugax Hornem. Hort. Hafn. 1: 50 = Romulea rosea (L.) Eckl.

fugax Salisb. Prod. 34 = Romulea sp. See excluded species.

furva Banks ex Ker in Konig & Sims Ann. Bot. 1: 224 = Geissorrhiza furva Ker ex Baker.

**fuscocitrina* (DC. in) Red. Lil. t. 86 = I. maculata L. var. fuscocitrina (DC.) Lewis.

galaxia L. f. Suppl. 93 = Galaxia ovata (L. f.) Thunb.

galaxioides Klatt ex Dur. & Schinz, Consp. Fl. Afr. 5: 184 = I. monadelpha De la R.

gawleri Schrad. Neues Journ. 4: 67 (1810) = Lapeirousia juncea Pourr.

**geminata* Vahl, Enum. 2: 68 = Geissorrhiza geminata E. Mey. ex Baker.

geminiflora Schrank, Denkschr. Bot. Ges. Regensb. 2: 188. See excluded species.

gibba Salisb. Prod. 38 = Tritonia deusta (Ait.) Ker.

gladiata L. f. Suppl. 93 = Bobartia gladiata (L. f.) Ker.

gladiolaris Lam. Encyc. 3: 341 = Tritonia securigera (Ait.) Ker.

gracilis Salisb. l. c. 37 = I. capillaris Thunb.

grandiflora De la R. Descr. Pl. Nov. 23 = Sparaxis grandiflora (De la R.) Ker.

**heterophylla* Willd. Sp. Pl. 1: 199 (1797) = Lapeirousia heterophylla (Willd.) Foster.

**hexandra* Schrank, Denkschr. Bot. Ges. Regensb. 2: 185 = Cyanella lutea L. f. See excluded species.

hirsuta L. Mant. 1: 27 = Dilatris corymbosa Berg.

**hirta* Thunb. Diss. Ixia 9 = Geissorrhiza erosa (Salisb.) Foster var. kermesina (Klatt) Foster.

(*hochstetterina* A. Rich. Tent. Fl. Abyss. 2: 309 = Hesperantha petitiana (A. Rich).) Baker).

holosericea Jacq. Hort. Schoenbr. t. 17 = Sparaxis grandiflora (De la R.) Ker var.

humilis Thunb. Diss. Ixia 8 = Geissorrhiza humilis (Thunb.) Ker.

hyalina (DC. in) Red. Lil. t. 87 = Tritonia squalida (Ait.) Ker.

hyalina L. f. Suppl. 91 = Tritonia hyalina (L. f.) Baker.

hyalina Salisb. Prod. 38; Willd. Enum. Hort. Berol. 57 = Tritonia crocata (L.) Ker.

hybrida Ker in Konig & Sims Ann. Bot. 1: 227 = I. polystachya hybrid.

imbricata De la R. Descr. Pl. Nov. 17 = Geissorrhiza imbricata (De la R.) Ker.

**incarnata* Jacq. Ic. t. 282; Coll. Suppl. 12 = I. latifolia De la R.
**inflexa* De la R. Descr. Pl. Nov. 15 = Hesperantha inflexa (De la R.) Foster.
iridifolia De la R. l. c. 24 = Tritonia crocata (L.) Ker.
iridifolia Link. Enum. Hort. Berol. 1: 52 = Watsonia meriana Mill.
juncea Link. l. c. 50 = Geissorrhiza juncea (Link.) A. Dietr.
lacera Herb. Linn. ex Roem. & Schult. Syst. 1: 398 = Sparaxis grandiflora (De la R.) Ker.
**lancea* Jacq. Ic. t. 281 = I. marginifolia (Salisb.) Lewis.
**lancea* Thunb. Diss. Ixia 18 = Tritonia lancea (Thunb.) N. E. Br.
lapeirousia J. F. Gmel. Syst. 108 (1796) = Lapeirousia compressa Pourr. (1788).
larochei Roem. & Schult. 1: 379 = Geissorrhiza rochensis (Ker) Ker.
5. *latifolia De la R. Descr. Pl. Nov. 22. p. 81
**laurea* Steud. Nom. ed. 2, 1: 779, 841, sphalm. = I. marginifolia (Salisb.) Lewis.
leipoldtii Lewis, Ann. S. Afr. Mus. 40: 121 (1954). 8
**leucantha* Jacq. Ic. t. 278; Coll. Suppl. 11 = I. polystachya L.
lilacina Eckl. Top. Verz. 27. Nomen nudum. = I. polystachya L.
liliago (DC. in) Red. Lil. t. 109 = Sparaxis grandiflora (De la R.) Ker.
**linearis* Jacq. Coll. 4: 183 = Hesperantha radiata (Jacq.) Ker.
**linearis* L. f. Suppl. 92; Thunb. Diss. Ixia 12 = Gladiolus linearis (L. f.) N. E. Br.
lineata Salisb. Prod. 35. See excluded species.
**longiflora* Berg. Descr. Pl. Cap. 7 = I. paniculata De la R.
**longiflora* Lam. Encyc. 3: 342 = I. paniculata De la R.
longifolia Jacq. Hort. Vind. 3: 47 = Hexaglottis longifolia (Jacq.) Vent.
36. longituba N. E. Br. Journ. Linn. Soc. Bot. 48: 43 (1928). Nom. nov. p. 156
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37. micrandra Baker, Journ. Bot. 14: 237 (1876). p.
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minima Schrank, Denkschr. Bot. Ges. Regensb. 2: 179. See excluded species.

**minuta* L. f. Suppl. 92 = Pauridia minuta (L. f.) Dur. & Schinz.

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monadelphia Burm. f. Fl. Cap. Prod. 1 = I. monadelpha De la R.

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**monanthos* Thunb. Fl. Cap. 1: 226 = Geissorrhiza monantha (Thunb.) Eckl.

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**namaquana* L. Bolus, S. Afr. Gard. 21: 369 = I. rapunculoides Red. var. namaquana (L. Bol.) Lewis.

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**nervosa* Baker, Handbk. Irid. 166 = Tritoniopsis nervosa (Baker) Lewis.

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nigro-albida Klatt, Abh. Naturf. Ges. Halle 12: 396 = I. conferta Foster var. ochroleuca or hybrid.

**obtusata* Soland ex Ker, Bot. Mag. t. 672 = Geissorrhiza imbricata (De la R.) Ker.

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**ochroleuca* G. Don in Sweet Hort. Brit. ed. 2, 502 (1830); Bot. Mag. t. 1285 = I. conferta Foster var. ochroleuca (Ker) Lewis.

**ochroleuca* Vahl, Enum. 2: 50 = Romulea chloroleuca (Jacq.) Baker.

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**ornithogaloides* Lichst. ex Roem. & Schult. Syst. 1: 376 = Geissorrhiza ornithogaloides Klatt.

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**ovata* Sweet Hort. Brit. 399; Klatt Abh. Naturf. Ges. Halle 12: 396 = I. conferta Foster.

pallens Ait. ex Steud. Nom. ed. 1. 453 = I. patens Ait.

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34 paucifolia Lewis, S. Afr. Gard. 23: 213 (1933).

pectinata Vahl, Enum. 2: 62 = Tritonia pectinata (Vahl) Ker.

pendula L. f. Suppl. 91; Thunb. Diss. Ixia 15 = Dierama pendulum (L. f.) Baker.

*_pentandra_ L. f. Suppl. 92 = Ixia scillaris L.

(_petitiana_ A. Rich. Tent. Fl. Abyss. 2: 309 = Hesperantha petitiana (A. Rich.) Baker).

*_phalangioides_ Roem. & Schult. Syst. 1: 385 = Geissorrhiza juncea (Link.) A. Dietr.

*_phlogiflora_ (Delile in) Red. Lil. t. 432 = I. latifolia De la R.

*_pigmaea_ Burm. f. Fl. Cap. Prod. 1 = Babiana pygmaea (Burm. f.) N. E. Br.

pilosa L. f. Suppl. 92 = Hesperantha pilosa (L. f.) Ker.

*_planifolia_ Mill. Ic. 160. t. 239. f. 2; ex Roem. & Schult. Syst. 1: 400 = Tritonia hyalina (L. f.) Baker.

plantaginea (Soland. in) Ait. Hort. Kew 1: 59 = Micranthus plantagineus (Ait.) Eckl.

*_plicata_ Lam. Encyc. 3: 336 = Babiana stricta (Ait.) Ker.

*_plicata_ L. Cent. Pl. 2: 4; Amoen. Acad. 4: 300 = Babiana villosula (Gmel.) Ker ex Steud.

*_polystachia_ Ker, Bot. Mag. t. 629 = I. micrandra Baker var. confusa Lewis var. nov.

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*_polystachya_ Jacq. Ic. t. 275; Coll. 3: 269 = I. stricta (Eckl. ex Klatt) Lewis.

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*_pudica_ Banks ex Ker, Bot. Mag. sub t. 575 = Romulea rosea (L.) Eckl. var. pudica (Ker) Baker.

*_pulcherrima_ Eckl. Top. Verz. 24 = I. campanulata Houtt. & I. framesii L. Bolus.

pulchra Salisb. Trans. Hort. Soc. 1: 320 = I. viridiflora Lam.

(_pumila_ Forst. f. in Comm. Gotting. 9. t. 2 (1789) = Tapienia magellanica).

*_punctata_ Andr. Bot. Rep. t. 177 = Thereianthus bracteolatus (Lam.) Lewis.

punicea Eckl. Top. Verz. 24. Nomen nudum. = I. patens Ait.

*_punicea_ Jacq. Ic. t. 287; Coll. Suppl. 12 = Babiana villosa (Ait.) Ker.

*_punicea_ Spreng. Neue Entdeck. 1: 254 = _I. sprengeliana_ Schultes.

(_purpurascens_) Tenore, Fl. Nap. 1: 13. t. 3 = Romulea purpurascens).

*_purpurea_ Jacq. Ic. 286; Coll. 3: 268 = Babiana purpurea (Jacq.) Ker.

purpurea Klatt ex Dur. & Schinz, Consp. Fl. Afr. 5: 186 = I. monadelpha De la R.

purpurea Lam. Encyc. 3: 341 = Tritonia crocata (L.) Ker.
**pusilla* Andr. Bot. Rep. t. 245 = Geissorrhiza pusilla (Andr.) Klatt.
**pygmaea* Roem. & Schult. Syst. 1: 403 = Babiana pygmaea (Burm. f.) N. E. Br.
**pyramidalis* Lam. Encyc. 3: 334; Illustr. 1: 108 = Lapeirousia speciosa Schltr.
quadrangula De la R. Descr. Pl. Nov. 16 = Geissorrhiza quadrangula (De la R.) Ker.
**quadrangularis* Burm. f. Fl. Cap. Prod. 1 = Geissorrhiza secunda (Berg.) Ker.
(*quartiniana* A. Rich. Tent. Fl. Abyss. 2: 310 = Acidanthera bicolor Hochst.).
radians Thunb. in Hoffm. Phytog. Blaett. 1 (1803) 3 = Geissorrhiza rochensis (Ker) Ker var. spithamaea (Ker) Ker ex Baker.
radiata Jacq. Coll. Suppl. 15 = Hesperantha radiata (Jacq.) Ker.
(*ramiflora* Tenore, Syll. 25 = Romulea ramiflora).
**ramosa* Ker, Bot. Mag. sub t. 549 = Geissorrhiza juncea (Link.) A. Dietr.
3. *rapunculoides (Delile in) Red. Lil. t. 431. p. 70
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recurva Vahl, Enum. 2: 58 = Hesperantha radiata (Jacq.) Ker.
recurvifolia Poir. Encyc. Suppl. 3: 201 = Romulea recurvifolia.
reflexa Andr. Bot. Rep. t. 14 = Ixia scillaris L.
reflexa Thunb. Fl. Cap. ed. 2, 55 = Romulea bulbocodiodes (De la R.) Baker.
reticularis Salisb. Prod. 37. See excluded species.
reticulata Thunb. Fl. Cap. ed. Schult. 60 = Tritonia lineata (Salisb.) Ker.
**retusa* Salisb. Prod. 35 = I. stricta (Eckl. ex Klatt) Lewis?
rochensis Ker, Bot. Mag. t. 598 = Geissorrhiza rochensis (Ker) Ker.
**rochensis* L. Bolus, Journ. Bot. 67: 133 = I. bellendenii Foster.
rosea L. Syst. ed. 12, 75 = Romulea rosea (L.) Eckl.
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rouxii Lewis, S. Afr. Gard. 21: 369 (1931).
**rubrocyanea* Jacq. Ic. t. 285; Coll. 3: 268 = Babiana rubrocyanea (Jacq.) Ker.
**scariosa* Thunb. Fl. Cap. 243 (1811) = I. latifolia De la R.
sceptrum Hort. ex Baker, Journ. Linn. Soc. Bot. 16: 158 = Watsonia marginata (Ait.) Ker.
scillaris L. Sp. Pl. ed. 2, 52.
scillaris Mill. Gard. Dict. ed. 8, n. 3 = Babiana stricta (Ait.) Ker.
**scillaris* Thunb. Diss. Ixia 13 = Geissorrhiza juncea (Link.) A. Dietr.
**secunda* Berg. Descr. Pl. Cap. 6 = Geissorrhiza secunda (Berg.) Ker.

*_secunda_ De la R. Descr. Pl. Nov. 17 = Geissorrhiza mathewsii L. Bolus var. eurystigma (L. Bol.) Foster.

*_secunda_ Houtt. Handleid. 12: 33—4. t. 78. f. 1 (1780) = Geissorrhiza rochensis (Ker) Ker var. spithamaea (Ker) Ker ex Baker.

serotina (Masson) Salisb. Prod. 34 = I. polystachya L.

setacea Thunb. Diss. Ixia 13 = Geissorrhiza setacea (Thunb.) Ker.

similis Salisb. Prod. 38 = Tritonia squalida (Ait.) Ker.

socialis Salisb. l. c. 35. See excluded species.

sordida Hornem. Hort. Hafn. Suppl. 6 = Sparaxis sp.

*_sparrmanni_ Schult. Mant. 1: 285 = Freesia sparrmanni (Thunb.) N. E. Br.

sparsa Mill. Gard. Dict. ed. 8, n. 7 = Sparaxis grandiflora (De la R.) Ker.

spathacea (Soland.) ex Ker, Bot. Mag. sub t. 1483 = Gladiolus trichonemifolius Ker.

*_speciosa_ Andr. Bot. Rep. t. 186 = I. campanulata Houtt.

spectabilis Salisb. Prod. 35 = I. viridiflora Lam.

*_spicata_ Andr. var. _viridi-nigra_ Bot. Rep. t. 29 = I. viridiflora Lam.

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*_spicata_ Willd. Sp. Pl. 1: 200 = Micranthus alopecuroides (L.) Eckl.

splendida Lewis, Journ. S. Afr. Bot. 4: 9 (1938). p.153

sprengeliana Schult. Mant. 1: 282. See excluded species.

squalida Ait. Hort. Kew. 1: 61 = Tritonia squalida (Ait.) Ker.

*_squalida_ Thunb. in Hoffm. Phytogr. Blaett. 1: 4 = Tritonia securigera (Ait.) Ker.

stellaris Hill Veg. Syst. 10: 3. See excluded species.

stellata (_tricolor_) Hort. ex Roem. & Schult. Syst. 1: 401 = Sparaxis tricolor (Schneev.) Ker.

*_stellata_ Klatt, Abh. Naturf. Ges. Halle 12: 396 = I. latifolia De la R.

stohriae L. Bolus, S. Afr. Gard. 21: 281 (1931).

stolonifera Lewis, Ann. S. Afr. Mus. 40: 14 (1952). p.

striata Vahl, Enum. 2: 65. See excluded species.

*_sublutea_ Lam. Encyc. 3: 335 = Romulea triflora (Burm. f.) N. E. Br.

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*_tenella_ Klatt, Abh. Naturf. Ges. Halle 12: 396 = I. capillaris L. f.

*_tenuiflora_ Vahl, Enum. 2: 66 = I. paniculata De la R. var. tenuiflora (Vahl) Baker.

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*_teretifolia_ Banks ex Ker, Bot. Mag. t. 523 = Micranthus tubulosus (Burm. f.) N. E. Br.

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trifolia Lewis, Fl. Pl. S. Afr. 14: t. 543 (1934). p.171

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**tubulosa* Burm. f. 1. c. = Babiana tubulosa (Burm. f.) Ker.

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**undulata* Burm. f. 1. c. 1 = Tritonia undulata (Burm. f.) Baker as to name.

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**villosa* Jacq. Ic. t. 284 = Babiana villosula (Gmel.) Ker ex Steud.

villosa Schneev. Ic. t. 16 = Babiana rubrocyanea (Jacq.) Ker.

**villosa* Ait. Hort. Kew. 1: 58 = Babiana villosa (Ait.) Ker.

**villosula* J. F. Gmel. Syst. 110 = Babiana villosula (Gmel.) Ker ex Steud.

**violacea* Banks ex Ker, Bot. Mag. t. 598 = Geissorrhiza rochensis (Ker) Ker var. spithamea (Ker) Ker ex Baker.

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virginea Soland. ex Ker in Konig & Sims Ann. Bot. 1: 225 = Hesperantha angusta (Jacq.) Ker or H. bachmannii Baker.

17. viridiflora Lam. Encyc. 3: 340 (1789). p.114

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**zeyheri* Baker, Handbk. Irid. 166 = Thereianthus juncifolius (Baker) Lewis.

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